231 but which, as Williams says in his discussion on Orokaiva domestic animals
(1930: 60–3), are all ultimately destined for the pot. The fowl population has
likewise remained more or less constant for some time (e.g. about 30 in Inonda,
235 40 in Sivepe). The birds are useful not only as a source of meat and eggs, but
also of cockerel feathers which are plucked and used for decoration on
headdresses, spears, etc. Unlike the dogs, the fowls are no longer a purely
[177] indigenous variety: they have been crossed with Rhode Island Reds introduced
in the 1950s.

231 A few years before I did my fieldwork, the government began a vigorous
campaign to eliminate pig husbandry from Orokaiva villages, in an attempt to
[744] improve village hygiene. Though this campaign generally was not very successful,
domestic pigs had all but disappeared from the villages where I stayed. Like the
other domestic animals they were left to forage for food most of the time but
were also fed with pieces of taro and other left-over food, as well as pawpaw,
coconut, etc. They mostly slept under the houses, but were free to roam. Males
[825] were castrated and females were fertilised by boars roaming in the bush. A close
quasi-kinship link was assumed to exist between the pig and its keepers, and this
was emphasised by taboos on eating a pig reared by a close relative. Techniques
of domestication will be discussed below.

241 *Horticulture*. The Orokaiva word *pure* has at least two important meanings:
'work' and 'garden'. As elsewhere in Papua–New Guinea, the garden is a centre
of sexual, social, religious as well as industrial activity.

The main product is taro which occupies perhaps nine tenths of the area. But a great variety of other plants are also found: banana, sugar-cane, edible pitpit, German taro (*xantosoma*), a few introduced vegetables such as pineapples, tomatoes, beans, and some sweet potato. Some trees may also be planted though these will not bear until long after the garden has been abandoned: breadfruit, *tauga*, coconut, areca. In addition there are always some herbs and medicines, and if the gardener is a professional medicine man there will be a great many of these. Yams are grown in separate gardens.

Very full data on the size of these gardens have been provided by Crocombe
and Hogbin (1963) and Rimoldi (1966). A household tends to establish
something like one and a half to two acres of garden per year. A garden is never
used for more than one taro season, but as planting and consumption of the taro
each tend to be stretched over most of a year, almost two years elapse
between the clearing and final abandonment. This gives time for the bananas and
sugar-cane to reach maturity too. Once a garden is abandoned, it is not used
again for at least eight years or so. The usual swidden agriculture techniques are
used, burning, clearing, careful removal of 'rubbish' remaining after the burning
process, planting with a digging stick, periodic attention to weeding and heaping
up of earth around growing taro, removal of corm-bearing bases of petioles of
[242] mature taro for removal and planting in a new garden. The Orokaiva practise no
irrigation, no form of terracing or drainage, no manuring, no measures against
parasites. Sometimes a fence is made out of tree trunks to keep pigs from
breaking in. This is usually done only after a pig has made its first expedition,
and only on the side where the pig entered.

While planting and harvesting proceeds almost throughout the year there are
[132] important seasonal variations that should not be ignored. There is a dry and a

[TEXT CONTINUED ON PAGE 22]

TABLE II/3

FOOD PLANTS PER HOUSEHOLD: INONDA AND SIVEPE COMPARED

(*Sources*: Crocombe and Hogbin, 1963: 8; Rimoldi, 1966: 17)

Crop	*Inonda*		*Sivepe*	
	Average	*Range*	*Average*	*Range*
Taro (*colocasia* sp.)	1.3 acs.	2.6–0.4 acs.	0.97 acs.	0.39–2.30 acs.
Sweet Potato	0.2 acs.	0.4–0 acs.	0.07 acs.	0–0.20 acs.
Corn	72 plants	140–0 plants	223 plants	0–442 plants
Bananas	81 trees	145–12 trees	71 trees	35–126 trees
Pitpit (*ina*)	56 clumps	181–4 clumps	88 clumps	0–400 clumps
Sugar	71 clumps	167–34 clumps	34 stools	11–54 stools
Yams	24 vines	61–0 vines	65 vines	0–136 vines
Manioc	10 plants	27–4 plants	a few	
Taro (*xantosoma* sp.)	5 plants	25–0 plants	28 plants	0–91 plants
Native Cabbage	–	–	22 plants	0–100 plants
Pawpaw	–	–	17 trees	5–32 trees
Beans	a few		17 plants	0–110 plants
Cucurbits	2 vines	10–0 vines	13 vines	9–28 vines
Shallots	a few		a few	
Ginger	–	–	a few	
Tobacco	–	–	18 plants	0–59 plants
Pineapples	1 plant	7–0 plants	no data	
Tomatoes	a few	–	no data	

311
241

241 [132] wet season throughout the Northern Territory. On the Mount Lamington foothills, the dry season is comparatively short and somewhat undependable, but it is usually over by the beginning of September. Here cultivators must be sure to have enough dry weather for a successful burn prior to planting. 'A significant proportion of the mineral energy upon which swidden cultivates draw for their growth comes from the ash remains of the fired forest, so that the completeness with which a plot is burnt is a crucial factor in determining its yield, a fact of which probably all swidden cultivators are aware.' (Geertz 1966: 22–3) Furthermore, it is unwise to leave the burn until too late in the dry season, for if the soil has dried out (which it does quickly in the tropics), taro plants develop few shoots, so that the gardener may be short of shoots for planting out. Hence, I was told, a very substantial amount of clearing and planting needs to be done between June and August. There is thus a flush of produce nine or ten months later, i.e. from April to June. The same rhythm also applies in drier areas, nearer the coast, such as Inonda, because there the danger of the soil drying out is even greater and the dry season much longer. When we find that the principal Orokaiva feasting season is from April to June, we can see that this is ecologically determined, as it is then that taro is most plentiful.[5]

243 476 While most subsidiary crops are grown in the taro garden, it is a fixed rule that taro and yam should never be grown together. While taro is usually grown by individual households, yams are planted and harvested by co-operative groups, around the same time as the main taro planting and harvest, but yams are usually stored for several months until the next dry season. Yam houses are built in yam gardens and used for the storage of no other crop.

245 249 177 473 *Arboriculture.* Although the Orokaiva traditionally planted coconut, betelnut and a few other trees in gardens, villages and in the bush, their arboriculture used to be rudimentary in comparison to their precise and detailed attention to tubers, especially taro. The Australian authorities had hardly established themselves in Papua before they began to press the population into extensive arboriculture that would yield a cash income. One of the early 'native regulations' (No. 121, passed in 1903), compelled all Papuan villages to grow a stipulated number of rubber trees. Three such rubber stands were established at Sivepe, ranging from one half to three acres in area, all village men supposedly sharing in the work. Rimoldi (1966: 86–93), who describes in detail the vicissitudes of exploitation of these trees, shows how ill-adapted communal rubber stands are to a society lacking institutions for the distribution of corporate assets to its members. Nonetheless, a further stand was established, this time quite voluntarily, in 1964. They are known as the 'company trees', have not yielded any cash, and will be discussed in detail below as the land transactions involved cast light on the ideology of contemporary Orokaiva co-operative movements.

245 473 'Communal' village plantations for coffee were established in the Northern District under the same regulations as applied to rubber, but all producing trees in the villages I visited had been grown on quasi-individual holdings. First plantings were around 1955. On a rough estimate I would say that the number of trees in Sivepe and Hohorita, two villages on the foothills, were 3,500 and 15,000, while Inonda, on alluvial plains, had 800. Coffee is one crop that

222 4 Orokaiva: *tauga*; botanical: *cycas media*; Orokaiva: *puga*; botanical: *terminalia okaria*. There are two varieties of breadfruit, called *oga* and *eumba*. They are both somewhat unusual but I failed, in spite of sending samples, to obtain indentifications.

241 5 Details of garden production are given in Table II/3. Rainfall at Sivepe and Inonda is shown in Rimoldi 1966:109; Crocombe and Hogbin 1963:100.

342 6 A plan of a contemporary Orokaiva house is shown in Fig. 3. Recent changes in house design, house construction and domestic amenities are summarised in Table II/4.

462 7 See Tables II/5 and II/6. Williams' data are taken from an unpublished manuscript and appeared first in Schwimmer 1969:226. I have discussed the Orokaiva division of labour in more detail in Schwimmer 1969: 145–50 and explained the apparent discrepancies between Williams' table and Waddell's and Krinks' statistics.

439 8 Crocombe and Hogbin (1963) provide a list of prices prevailing in this
trade. They report that there is still some trade in shell ornaments from the coast
437 and in feathers for head dresses from the mountains. Informants at Eroro, on the coast near Buna, gave me details of their traditional trade with Managalasi of the nearby mountains. A Sivepe man who has hunting rights to land near Ajoro goes there to hunt birds and sell the feathers. His chances of finding any of the more valuable birds near Sivepe are remote. The difference in Sivepe and Inonda patterns (i.e. the foothills and the alluvial plains) appears from the data in Table II/7. It will be seen that Sivepe stock is to a far greater extent inherited, whereas Inonda stock is to a far greater extent acquired through brideprice (value $13), barter (value $21.60) and other exchanges (value $13.70).

439 9 Dr. Waddell has provided a detailed statistical table of the geographical
438 distribution of subsistence produce (Waddell and Krinks 1968:218). This table
provides clear and detailed information on the geographical range of the Sivepe
437 exchange network. A full descriptive account may be found in Schwimmer 1969: 41–69.

648 10 An interesting picture of this period of Orokaiva history is drawn in Beaver, 1916.

795 11 Full information on these cults will be found in Chinnery and Haddon (1917) and Williams (1928). If has escaped previous commentators that Bia, who started the taro cult, was employed for some years by Monckton, and participated in various punitive enterprises with an alacrity most pleasing to his master. He was described in Monckton's books in rather revealing detail (e.g. 1921: 185, 268, 269, 295, 308; 1922: 10, 13, 65, 136, 172, 214, 216). For the present relationship between the Orokaiva and the missions, see Schwimmer 1969: 123–33.

871 12 The general subject of Orokaiva economic development since 1951 is
very fully covered in numerous bulletins published by the New Guinea Research
872 Unit from 1963 to the present, and also in Schwimmer 1969. A general
797 indication of the investments in socio-economic development is given by a table
of public expenditure in the territory of Papua for the years ended 30 June 1961
657 to 1965 (Commonwealth of Australia: *Annual Report of the Territory of Papua
648 for the period 1 July 1964 to 30 June 1965*, 179). The growing emphasis on educational services is perhaps the most notable aspect. Table II/8 indicates the pattern of school attendance. Table II/9 summarises the activities of the Higaturu Local Government Council; roads, water supplies and clinics are perhaps the projects most relevant to development.

101 13 The three villages have been sketched in figures 4, 5 and 6. Education and occupational experience at Sivepe and Hohorita are analysed in Tables II/10 and II/11.

5: Schwimmer E-4,5 (1966-1967) 1973
OJ23 Orokaiva OJ23
Mountain Orokaiva

CHAPTER IV

THE EXCHANGE SYSTEM AND THE NEW AGE

1. *Cultural Changes*

177 Many significant changes have occurred in Orokaiva society since European
[241] contact. The introduction of cash cropping has made the Orokaiva, to some
[437] extent, into a peasantry, depending to a limited degree on monetised marketing.
Furthermore, there has been a large amount of labour migration, mostly by male
[167] workers whose families stay behind in villages. Even in the villages, technological
[433] innovations have been influential in raising productivity and improving standards
of living, while sharply reducing the game population. People have become
[657] accustomed to the existence of a specialised political authority, wielded by
Australians but supported and assisted by Papuan functionaries. Inter-village and
[797] inter-tribal warfare has been effectively suppressed. The Orokaiva give at least
nominal allegiance to Christianity, and thus to the principle of obedience to an
omnipotent god.

829 These changes have profound implications for Orokaiva political philosophy.
177 As we have seen, the Orokaiva recognised the importance of Hobbes' question:
how can a man avoid a perpetual war between all and all? The answer, briefly, was
657 that social order can be created by a system of exchange partnerships. But this
was not Hobbes' own answer nor that of the Australians who now rule New
Guinea. If the changes pursued by the colonial government are wholly
successful, it is clear that exchange partnerships, as the basic source of social
order, must become subordinate to legitimate central political authority and the
modern market economy. In other words, there is what Gluckman calls a
'contradiction' (1965: 109) between Australian policy and the exchange-oriented
Orokaiva social philosophy. It is possible, but cannot be predicted, that
this 'contradiction' will eventually lead the Orokaiva to abandon their traditional
exchange ideology. In the meantime, however, it is already clear to the Orokaiva
that their world view is being seriously challenged by white wealth and power.

436 The effect of pressure on the exchange system is evident in many spheres. In
the economic sphere, the Orokaiva still carry on most of their non-monetary
437 transactions by the traditional system, using gift exchange between consan-
431 guines, affines and bond friends. Furthermore, gifts of money are being made
along traditional lines, money being used either as a substitute for *hambo* and
other valuables, or as gifts from urban migrants to country kin. On the other
hand, store-bought goods are, by a general convention, excluded from the full
operation of the exchange system, only a minority being distributed as gifts. The

MODEL 7

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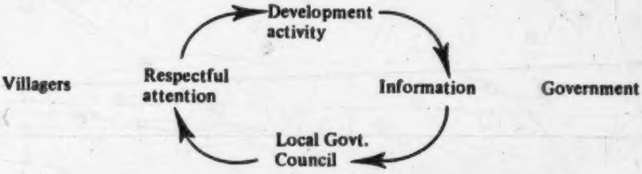

The elements of mediation are entirely indispensable in this relationship. Unless there is development activity, the government will feel that the relationship has broken down. Unless the councillors intervene, the government's information cannot be communicated.

657 177 Both the villagers and the government find this exchange cycle highly precarious. It is precarious for the villagers because social exchange, for the Orokaiva, implies a state of competition between the partners. It is unprofitable to engage in social exchange with a partner unless one can hope to equal him (and even better him) in wealth and power. This desire to equal (and defeat) the Europeans competitively is an ambition of which informants spoke to me occasionally when I came to know them well. It was quite clear to the Orokaiva that they could never achieve this objective by growing coffee on small village plots. Hence, they could not regard the activity advocated by the government as being worth engaging in for its own sake. The question facing them was: will this activity serve our ultimate end of achieving equivalence or victory? The term 'development activity', as used in model 7 implies that it is thought to serve this ultimate end.

657 177 241 789 I demonstrated in the previous chapter that all elements of mediation are essentially magical. The Orokaiva similarly regard development activity as magical. In response to this notion, government officers sometimes evolve rules of behaviour that look remarkably like magical formulae. One officer in the Northern District invented a regular weekly calendar which he thought the Orokaiva should follow. Certain days of the week should be set aside for coffee growing, others for growing and marketing extra garden crops, others for cleaning and improving the village, and so on. I heard the officer proclaim this calendar; later, I heard a councillor proclaim it in Sivepe village. It was listened to with respectful attention, but afterwards ridiculed by the village men. The formula was rejected because it was thought to be useless. There was, of course, a plethora of such formulae circulating as many officers thought up their own, and most officers were rapidly transferred from one job to another. It was natural, therefore, for the Orokaiva to become selective in the formulae they adopted. Also, experience showed them that the formulae did not always work.

177 657 789 The difference between this modern magic and the traditional varieties lies in the greater uncertainty of the prescription. The Orokaiva habitually use an experimental approach to magic: if one medicine does not work, then try another. But all traditional medicine has at least an impeccable source: it was given by the ancestors. The magic of 'development' (money, Western technology, Western power) was, in Orokaiva belief, ultimately derived from Jesus

writings of Berndt, Brookfield and Brown, Hogbin, Lawrence, Meggitt, Rappaport, 423
Salisbury, Serpenti, Wagner and several others. The Orokaiva system falls 171
within this general pattern, though with less emphasis on overriding rights held
by clan and lineage, and more emphasis on individual rights than, for instance
among the Siane and Mae Enga, less emphasis on corporate leadership than
among the Garia, and more incidence of duality of rights than among the
Chimbu, and so forth. Though the time has come when a comparative study of
these systems could profitably be undertaken, it falls outside my present
purpose which is to analyse the significance of land transactions, especially
among the Orokaiva.

In order to carry out this analysis, we must first describe the basic categories 423
of land transactions. We shall not use the term 'transactions' solely in a legal and
economic sense, but more broadly in accordance with Mauss' concept of 437
exchange as a total phenomenon. Thus, land enters crucially in 'transactions' 121
between husbands and wives, and between men and spirits, and these
'transactions' will be considered before we turn to the more familiar topic of
transactions between men. Here we have to distinguish between transactions
within and outside the patrilineage. Our general argument will be that all of
them occur as part of a continuing series of social exchanges, and that useholds
granted on varying conditions must be regarded basically as benefits exchanged
for other past or future benefits. In as much as paternal protection and filial
service are very common objects of social exchange in these transactions,
paternal protection being mediated by land grants, we may observe the practical
operation of a system of patrifiliation.

A few words should first be said about the significance of land itself. The 423
Orokaiva spend most of their days in their individual garden plots. They are tied
to them not only by a total dependence on the produce, but also by deep bonds 241 ●
of affection. A man and his wife like nothing better, generally, than to spend the 362
whole day, and virtually every day, in their garden together. These are intimate
places where nobody would go without an invitation and where nobody is
disturbed or called away except in a serious emergency. They are the most
private places the Orokaiva has, much more private than the village houses where
every sound and movement can be seen or overheard. Even so, physical privacy
is secured often by no more than a narrow ring of second growth around the
cultivations. Many people have a garden house, ornamental shrubs, places to rest
and sit. Orokaiva gardens can be very homely and beautiful. People rest there in
the heat of the day. They are favourite places for love-making. [633]

The most ubiquitous of all social transactions mediated by the land occur
between husband and wife. Perhaps the most important rights and obligations 581
arising out of marriage have to do with garden land. Both the male and female 423
gardening tasks are, of course, learnt before marriage. Bachelors have their own 241
gardens in which they do all the work which is not specifically set aside for [462]
women and taboo to men. They clear the land; they help with planting (using
the digging stick); they protect the land against pigs and other dangers; they [412]
weed. It is a fact, already observed by Williams, that a girl choosing a husband
takes serious account of the state of the garden of her intended spouse. She does
not like to marry a man whose garden is in a poor state. The bachelor is assisted
by a sister, or brother's wife, or by his mother with the dropping of seed into the

423 ground, and with harvesting, which he may not do. Upon marriage, the new wife
is usually expected to garden on her husband's land. There is a fiction that, at
241 the time of marriage, she 'does not know' the work she is expected to do on the
[581] land of her new affines. Her mother-in-law has to instruct her and it is only after
[585] such an apprenticeship that her husband's people consider her competent to
tend taro on their land, harvest it and offer it to visitors in proper style. She
would usually have been trained in these tasks by the women of her own clan,
but the subtleties of family traditions differ.

423 As against these male and female obligations, we may note some clearcut
593 rights: the man's right to his wife's labour and the wife's equally important right
of unlimited access to the husband's garden land and to its produce. This right
241 extends not only to harvesting food for the household, but also for gifts she may
choose to make outside the household, providing that she manages the food
[578] supply so as to avoid shortages. A domestic dispute I observed in Sivepe
[586] (referred to in Chapter III above) illustrates the importance attached to this
married woman's right. When this dispute was adjudicated, the 'explanation' of
the breakdown of the marriage was found in a single incident, namely the
husband's instruction to his wife not to go to his garden again. Here, in the view
of everyone present, lay the 'root' of the trouble, a judgement with which the
husband was willing to agree. This prohibition to go to his garden is one of the
few things a husband is on no account to utter to his wife; it amounts to total
repudiation of the conjugal relationship.

[431] This brief discussion of social practices has already indicated that a garden
plot is a gift made by a man to a woman, while the productiveness of the land is
[462] a gift from a woman to a man (because a man can neither plant nor harvest). Let
us now consider to what extent the nature of these gifts may be clarified in the
423 light of rituals, myths and indigenous explanations. It will be best to begin with
some legal ideas about land. As has been pointed out by Salisbury (1962: 67ff.)
241 among others, several sets of rights arise with respect to any one piece of land:
rights of the village, of the clan, of the lineage, and of the 'father of the ground'
or trustee. It is the last-mentioned person who assigns a piece of land (*enda*) to a
cultivator for the purpose of making a garden (*pure*). The cultivator to whom
[562] land may be assigned may be either male or female. Among the Orokaiva it is
[462] common for women to have land assigned to them for cultivation in their own
right, even though most land is assigned to males. They receive this land mostly
from a father or brother, sometimes from their mother. When a woman wishes
to have a garden established on her land, she (voluntarily) transfers the land to
her husband or another male on a temporary basis so that he can carry out the
[789] crucial male tasks without which the garden cannot be made. These tasks are
ritual as well as productive. It is common for the men of a clan to hold a feast
together and to kill a pig from which they eat and obtain strength (*ivo*), before
clearing new ground. The fertility of the soil depends greatly on getting a good
burn after clearing, and a good burn depends on climatic conditions that can
never be wholly predicted. I was unable to find out much about the ritual
connected with clearing but gather it had to do with control over the sun and
[775] the rain. Another magical danger that arises in new gardens comes from the
ghosts (*sovai*) lurking in the reverted gardens or bush that is being cleared. The
garden thus established is the gift made by the man to the woman; the *pure* is

felt to be a feminine thing. In the myths it is the mother who buries the taro 423
shoots (her children) and covers them with leaves and earth which are equated 241
with her body. I shall show this in more detail in the next chapter. [773]

In Williams' report on the division of labour, planting is shown as a female
task, whereas the time studies of Waddell and Krinks suggest that the activity is [462]
actually shared by the couple. There is no real contradiction here, nor much evidence of change, as the man's task is to pound holes into the soil with his digging stick whereas the woman does the actual planting, or burying (*kovari*) of the seed.

Unless the normal rules are suspended, as happens at feasting time, men do 241
not harvest taro or other products of the *pure* where taro is planted. (The rules
are different for the yam garden as we shall see later.) The explanation that is [462]
given of this rule is that only the women know how to harvest crops to best advantage, i.e. at the right time and in the right quantities. If men harvested, the supply would never last through the lean season. The woman is responsible for
nurture, in the widest sense. It is her task every day to bring home garden food [482]
in the large string bag suspended from her head. Contrary to what white
observers have sometimes believed, this is not a symbol of female slavery, but [562]
rather of female power and it is done proudly. When my wife started to bring home produce from our own garden in Sivepe (in a different kind of bag), the
women crowded round excitedly and congratulated her. The food gifts that are [431]
constantly sent from one household to another may be, at least partly, regarded as a display by the women of their own success. The products of the taro garden (though not the yam garden) may ultimately be regarded as a gift from women
to men. We may summarise the total transaction as follows: 562
241
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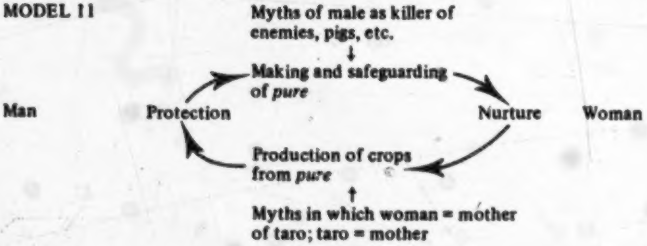
MODEL 11


Myths of male as killer of enemies, pigs, etc.
Making and safeguarding of *pure*
Man
Protection
Nurture
Woman
Production of crops from *pure*
Myths in which woman = mother of taro; taro = mother

On the basis of such a model, what precisely is the nature of 'rights' in land 423
enjoyed by husbands and wives? A simple analogy would be a jointly owned 593
machine of which one party controls all the bolts and the other controls all the nuts. The assets of neither party have any value independently of the other. Value can be created only by the co-operative *action* of screwing together bolts and nuts. Land transactions between Orokaiva husbands and wives are similarly a sequence of cumulative co-operative actions, such that each move by one party calls forth an appropriate response. The only 'rights' are 'rights' to responses
once certain moves have been made. Legal disputes can in practice arise only if [578]

423 one party fails to make the required response. It creates a wrong impression to
593 speak of land being 'vested' in a man if all he has (independently of some
[578] woman) is a cleared patch of ground on which nothing grows; nor is the woman
in a better position as she cannot (independently) bring any crop to maturity as
she needs the man's garden magic. As we shall see below, 'rights' in all Orokaiva
land transactions are limited in some way similar to this.

3. *Land Transactions between Men and Spirits*

775 A second basic transaction mediated by the land is that between the soul of a
423 recently deceased person and a new-born infant. The Orokaiva believe in
transmigration of souls. But this transmigration occurs through the mediation of
887 the piece of land where the spirit of the dead person has taken up special
241 residence. This is usually the garden he or she was cultivating at the time of
death. It is a fact of Orokaiva life that old people do not stop gardening as long
as they have any strength left in their bodies. Waddell's study of time allocation
in Sivepe showed that after the age of fifty-five, time spent on productive
subsistence activity, especially in the garden, declined only slightly, whereas
non-productive activity (e.g. social obligations, dealings with external agencies)
declined very sharply (1968: 104). Old people devote their reduced energies
almost exclusively to their gardens, grow progressively closer to their gardens
and away from the social network, until finally, after death, their spirit becomes
still more closely attached to the land. Their souls re-enter association with the
village through transmigration.

775 Crops from the garden cultivated by the deceased may not be eaten by any
member of the deceased's lineage. They are harvested by the heir and given
768 away by him to persons outside the lineage. No *bere* are taken from these crops.
241 After a suitable period of fallow, the garden is replanted, but even then the land
is not thought to be free of the deceased's spirit. Very often the son or brother
of the deceased plants the garden and uses the produce to give a feast. It is
thought that the spirit presents no danger to food grown in that plot afterwards.

775 Transmigration is affected by a ritual performed shortly after the birth of an
851 infant. The parents take the child to the land where the spirit of the deceased is
believed to reside. They seek the spirit by placing leaves of a fragrant plant called
774 *mo* in a creek which runs through the land. When the spirit is thought to have
entered the leaves, the parents address it thus: 'You are dead now. We shall look
after the land and we shall look after the baby so it will become big and strong.
Then this child will look after the land.' The wife, in preparation for this rite,
has brought the baby to the garden in a string bag, and has also brought a stick.
When she arrives in the garden, she places the stick in the ground and hangs the
baby in its string bag from the stick. After the ritual by the water, she drops
some of the leaves by the stick, then takes the baby, the bag and the rest of the
leaves and returns home with her husband. The custom is for the husband to say
at night: 'I hear the baby crying.' He is expected to go back to the garden and
talk to the baby that is believed to be in the stick, telling it that the parents will
now look after it and there is no need to cry. He should then take the stick, with
the 'baby' inside it, to his home.

[753] The significance of this ritual became a little clearer to me through the case of

a baby, named Jarata, who became sick and died at the age of nine months (of 775
gastro-enteritis). I was told the cause of death was the father's neglect to collect 851
the stick. The baby Jarata who died was described as a spirit baby (*meni ahihi*); 753
the real baby (*meni be*) had been left in the garden inside the stick and was
taken away by the fairies (*sovai*). When the baby became sick, the medicine man 774
went to collect the stick, no doubt with appropriate magic, but it was too late;
the 'real baby' was no longer there.

This explanation, referring to the father's neglect, was given by members of
Jarata's maternal clan. But I was given a second explanation by the child's
paternal clan. According to them, the child died because the mother did not
look after the land properly. The assumption here is that if the garden where the [241]
child obtains what we provisionally call his soul is well tended, then the child's
body will also grow well, but if the garden is neglected (horticulturally or
ritually), the child will become sick and die. This intimate connection between
the garden and the well-being of the soul endures to some extent throughout life
but is especially critical in infancy before a child is able to walk and grows teeth.

It is clear that the 'baby in the stick' resembles what is generally known as an 774
'external soul'. In its more usual form an 'external soul' resides in an object
which is carefully preserved from danger, for any vicissitude that may threaten
the object will also threaten the life of the person to whom the 'external soul'
belongs. Normally such an object is carefully buried and kept out of harm's way.
It appears that the Orokaiva do believe in external souls in this sense, and that [824]
they reside in particular specimens of a plant after which a person is named, but
that is not relevant here. The concept of the baby in the stick differs in [553]
interesting ways from the usual kind of 'external soul'.

The first difference is one of terminology. When I asked whether the part of 774
the baby that was in the stick was called its *ahihi* (spirit) this was denied 775
explicitly. On the contrary, it was the *ahihi* of the child that the mother took with her to the village after the ritual and it was the *ahihi* that the mother was left with when the child sickened and died. The child I had been looking at for several months and that died of gastro-enteritis was nothing but an *ahihi* and it was for that reason that it wasted away and could not live. The part left in the stick and stolen by the fairies was actually the child's *hamo*, its body. Emphatically, therefore, the Orokaiva believe that *ahihi* can be corporeal and that *hamo* can be incorporeal.

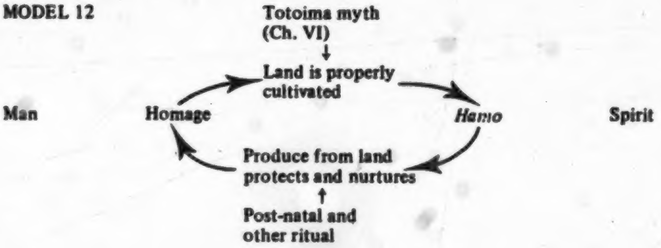
Let us now consider more precisely the transaction between deceased and
infant that may be called transmigration of souls, which is mediated through the
land. Let us start with the death of a man of the Seho clan who was called Jarata
(1). Jarata's spirit stayed on the land he had been cultivating at the time of
death. Some six years later, Jarata's brother lent this land for a season to [426]
Gilford, the husband of a classificatory sister. Gilford's wife was pregnant at the
time. When the infant was born, it was named by the man who had lent the land, [553]
and was given the name of the dead brother, Jarata. As far as I understand, the
effect of this act of naming was to attach the *ahihi* of Jarata (1) to the infant, Jarata (2). (A male infant may obtain its name from either its mother's or its father's patrilineage.) But in addition to *ahihi*, the baby had to be given bodily strength and vigorous growth, in other words, it had to have *hamo*. This could be obtained only from the garden where Jarata (1) was still present. Jarata's *hamo*

774 was thought to inhere in his old garden plot and in the products growing there,
775 or more specifically perhaps in the water flowing through the garden, for it is in
the water that the dead tend to live, even though in a more general sense they
[823] are everywhere in the garden, as well as in the abode of the dead under the
mountain and in other places also. The transfer of the *hamo* to the child is a drawn-out process that may last a year or so. It is done through the mediation of the stick. A mother carries this stick with her every day as she goes to the gardens and she is supposed to hang the child from the stick as she does her work. I have actually seen another mother do this for months. The child draws soul substance through the stick all the time and as the taro and other crops fill out and become vigorous, the child will do the same. It is through this absorption of *hamo* that the child can later fulfil the promise made to the dead Jarata, namely to look after the garden from which he has drawn his life-force.

769 The ritual formulae spoken by the parents in the garden and quoted above
both clearly have the form of a bargain, by which the spirit of the deceased is
775 asked to give *hamo* (a combination of supernatural protection and nutrient
774 strength) to the infant in exchange for proper homage. This transaction may be
expressed in the following exchange cycle.

•241

MODEL 12


Totoima myth
(Ch. VI)
Land is properly cultivated
Man
Homage
Hamo
Spirit
Produce from land protects and nurtures
Post-natal and other ritual

Superficially, it may appear that the exchange cycle given here offers a generalisation that goes far beyond the data I have presented. My data present a transaction between a deceased and a particular couple, with one particular child, who promise to look after the land. My model, however shows a transaction between any spirit attached to a piece of land, and any cultivator. Yet it may rightly be argued that every couple cultivates, at one time or another, a large number of plots, and that only some of these plots are linked to their cultivators through post-natal rites performed in respect of themselves or their children. This argument, however, is irrelevant. Spirits are attached to every garden plot, and there is always some person charged with the care of those
[596] spirits. The senior member of an extended family, the 'father of the ground'
(*enda mama*) has the ultimate responsibility to see that the spirits are not neglected. When he gives any cultivator a usehold over a piece of land, it is understood that this cultivator takes over the care of the spirits on the land. This care includes making food offerings to the spirit on a raised platform built for that purpose. More broadly, the responsibility to the spirit also involves the proper performance of all ritual and horticultural activities prescribed as parts of the cultivation cycle.

Why does man have this duty? According to the data I have presented, the 769
duty arises out of a promise made at the time of birth. The land is identified 775
with the ancestor who gave the infant its body. The cultivator works not only to
'survive' but also to repay to that ancestor the debt he has incurred by being 774
given a body. 241 ●

These beliefs are relevant not only to land as a mediating element between
living and dead, but also between man and man. The religious system is 423
unconcerned with the consanguineous relationship between the living servitor and the spirit of the dead. It is the service alone that counts, while the capacity to provide the service rests on no more than the authorised occupancy of land. The implication for land transactions between men is that such transactions can never be purely economic.

In the present instance Jarata's brother, in lending his plot to a classificatory brother-in-law, simultaneously passed over the duty to care for the spirit of his
dead brother, whose spirit resided on that plot. This is especially interesting as [614]
that affine (and his son Jarata (2), if he had lived) belonged to a clan different
from the spirit's. Thus, on a religious level, there is no recognition of a clan's 'right' to certain land, but only of a sequence of cumulative co-operative acts between man and spirit, such that each move by one party calls forth an appropriate move in response. We shall now turn to the social aspect of these transactions, i.e. the conditions upon which authorised occupancy is granted.

4. *Transfer of Useholds between Agnates*

In suggesting that land transfers should be studied as social rather than as 423
economic transactions, we may meet with the initial objection that land 425
transfers occur in response to economic needs and are adequately explained
without introducing social considerations. But among the Orokaiva, there are many land transfers for which an economic explanation would in practice be hard to find. Certainly there are cases where land is transferred to a household notably short of land, but I know of more cases where the purpose of transfer was to have the company of a good friend on a neighbouring plot and other cases where the only discernible purpose was to make a gift and strengthen a social bond. Crocombe and Rimoldi have recorded a large number of land transfers in Inonda and Sivepe, a large proportion of which were outside the extended family and even outside the lineage. By no means all of these were redistributions to help the deprived. Many were mainly for the sake of strengthening sociability. It is therefore reasonable to inquire into the significance of land in the mediation of social relationships.

We may, first of all, divide these transfers into two broad types: those 423
occurring within corporate groups, and those occurring outside them. In a strict 425
unilineal system, it would be possible to draw a land map showing areas owned
by a lineage, and if the system were segmentary, one might speak of a clan 611
domain, a tribal domain and so forth. Such boundaries would theoretically remain unchanged in perpetuity as each generation inherited holdings in the patriline or matriline. No New Guinea system of which we have a recent professional description approximates even remotely to such a model, at least in practice, as we find that many land holdings in so-called patrilineal groups pass into the hands of uterine kin and affines. Among the Orokaiva the departures

Origins of the System (1894 - 1918)

From the beginning of British administration in Papua 657 in 1888, it was policy to encourage Papuans to engage in cash 241 cropping. MacGregor, the first Lieutenant-Governor, advocated cash cropping to those villagers he met in his tours of the country, but such incidental advice by an intinerant official was probably not very influential. [466] The first legislative provision to promote cash cropping was a Native Regulation, introduced by MacGregor in 1894, [245] which provided that magistrates could compel indigenous people to plant coconuts on penalty of a fine.(1) This was extended in 1903 by a regulation which provided for compulsory planting of other economic trees. [177] Native agriculture was not, however, the main plank of agricultural policy for although government staff were trained to "treat natives justly" they were directed "above all to prepare the country for development by Europeans. There is not, and there has not been, any other policy".(2)

Planting under the regulations took place slowly, and only in areas which were under the close supervision of magistrates. It appears that there was little planting of cash crops [433] by Papuans other than under the compulsion of the regulation and at this stage it does not seem to have been a matter of concern to the Administration whether the people planted individually or in groups. It has not been possible to determine which pattern was most frequently followed in practice, though the examples noted in the literature mostly involved planting by village or clan groups rather than by individuals. Coconuts were the main crop planted under the regulations, but rice, rubber, kapok, peanuts and fruit trees were tried in smaller quantities in some areas.(1) 657 241

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(1) Native Regulation No. 2, 1894. Miles (1956: 318) regards MacGregor's technique for promoting native agriculture as unusually enlightened, but in fact it seems to have been almost universal in the Pacific at that period, and MacGregor had become familiar with it while serving under Sir Arthur Gordon in Fiji. Similar regulations were introduced by Germany to Samoa and New Guinea, by the United Kingdom to Fiji and the Gilbert Islands, by New Zealand to the Cook Islands and by Holland to Indonesia.

(2) MacGregor to Lamington 4.10.1898 (quoted in Healy 1962 : 84).

657 464 177 [433] After the turn of the century less emphasis was given to the policy of expanding indigenous plantings of cash crops and instead Papuans were persuaded to work as labour on European plantations. In 1906 the Lieutenant-Governor stated that not only was staff inadequate to enforce the 1894 regulation, but that where it was enforced the resultant income attracted traders whom he felt to be a bad influence on the Papuan people. Employment on European plantations, on the other hand, was considered to be beneficial.(2) This policy remained until after the first world war, though some Resident Magistrates also applied the regulations in order to extend native plantings.

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(1) For a more detailed study of the application of these regulations see Miles 1956 : 319-23.

(2) Territory of Papua Annual Report (hereafter abbreviated to P.A.R.) 1905-6 : 9.

Native plantations as the mainstay of agricultural policy (1918 - 40)

657 179 After the 1914-18 war, a shortage of labour, low produce prices and high shipping costs made it very difficult to attract European settlers to Papua. The emphasis of agricultural policy was therefore shifted and indigenous agriculture was seen as the only hope for the future. "If we cannot attract capital to develop the Territory", the Lieutenant-Governor wrote, "we must develop it without capital - that is, by native agriculture" (P.A.R. 1921-2 : 6). He saw two particular advantages in native agriculture over European; it did not require hired labour and it did not require large amounts of capital. It was clear the country would not be developed by the few European plantations then in operation (with a planted area of about 61,000 acres in 1923) and for the next decade at least Murray gave great emphasis to the development of "native plantations".

245 249 657 [466] In the Northern District(1) there had been little planting under the regulations since the turn of the century, but with the outbreak of the first world war the Resident Magistrate gave priority to expanding output by the compulsory planting of coconut, rubber and citrus trees, and 10,000 coconut and other economic trees were planted in 1914-15 under the direct supervision of patrol officers (P.A.R. 1914-15 : 49). By 1921 there were 46,404 coconut trees in the Orokaiva area but over half (25,642) had been planted within the previous five years. Almost all the rubber trees had been planted in the previous five years (P.A.R. 1920-1 : 48-50).

657 241 Although the regulations did not prescribe that planting was to be either by individuals or groups, in all the post-1914 instances we are aware of in the Orokaiva area, each village or cluster of villages was in fact directed to plant as a

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[131] (1) The Orokaiva area was included in the Buna and Kokoda Districts of the Northern Division until 1909, then in the Kumusi Division until 1920, and in the Northern Division (later termed the Northern District) since 1920.

group.(1) Group planting seems to have been the general 657
pattern in other parts of the Territory too. In the Western
District in particular, the Resident Magistrate initiated schemes 241
for cash crop plantations being owned and operated by each [423]
village as a whole. Profits were to be used for projects which
would be of benefit to the village community (P.A.R. 1913-14:12). [434]
About fifty such plantations were established under the scheme.

During this post-war drive (and probably in 1920) a 657
government officer assembled the people of the nine villages(2)
of the northern branch of the Asigi tribe and instructed them to 245
choose a site and plant an area of coconuts for the nine villages
as a whole.(3)

A central site was chosen near Ongoho on land be- 245
longing to the Akute'undi sub-clan (most of the members of
which lived in Ongoho village), and about 500 coconuts were
planted as a community project by the men of the nine
villages.(4) They were to be used exclusively for copra making
(there were ample coconut trees in the villages for domestic
use) and work and profits were to be shared equally among the
able-bodied men. Small plots of rubber and citrus trees had [249]
been established at Ongoho under the same scheme a year or
two earlier. The citrus was intended to be used primarily as a
latex coagulant for the rubber, and only secondarily as a cash [433]
crop.

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(1) In some instances in the coastal villages of the Northern District each individual planted his own trees, but all villagers planted in one "village" block on the land of one man or of one descent group.

(2) Ongoho, Hongorata, Ivisusu, Sowai, Weki, Ondahari, Oere, Girigirita and [361]
Heherita. Sowai and Weki were later abandoned and today their populations live
together at a new village named Sotokoiari. Likewise Girigirita and Heherita have [103]
amalgamated and moved to a new site. The new village is called Girigirita.

(3) Data in this section of the report was collected by interview only in the villages [124]
concerned during April-May 1963. [101]

(4) The annual reports show that in 1921 there were 518 coconut trees over five years old and 1,287 under five years old in the Asigi area. The nine villages listed above comprise about half of the total Asigi population. The 518 mature trees were probably those planted in the villages. Trees in the community block which did not survive were not replaced, and as the ground has not been cleared since the second world war, many have died. There were 198 trees still standing in 1963.

The Native Plantations Ordinance

In addition to the post-1918 drive for increased planting under the regulations a new policy was introduced with the dual aim of increasing village production and government revenue.⁽¹⁾ The old regulations had provided for compulsory planting only, but the new ordinance provided for continuous supervision and compulsory maintenance and harvesting of gardens, as well as processing and marketing facilities. Under the heading "Compulsory labour in the natives own interest", Sir Hubert Murray claimed that "the most obvious, and possibly the only solution is to encourage, or if necessary to compel, the native to work for his own benefit" (P.A.R. 1921-2 : 16). 657 466

The new policy was embodied in the Native Plantations Ordinance 1918 (and amendments)⁽²⁾ which provided for the establishment of community plantations in which both the government and the villagers would participate. Profits were to be shared equally between the government and producers.⁽³⁾ The Lieutenant-Governor was empowered to direct that any Crown land could be set aside as a Native Reserve for the purpose of establishing a plantation. Alternatively, with the consent of the land owners "whose property the land remains", plantations could be established on native land. 423 657 [434]

The earlier Native Regulations which provided for compulsory planting of cash crops were not repealed, but they seem to have been used much less after the new Ordinance became operative in the 1920's. 657 241

The available sources give little indication of the reasons for emphasis being placed on group plantations rather than individual plots, though Miles (1956 : 323) hazards the view that it facilitated control and inspection, and that the indigenous

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(1) For a discussion of the emphasis on raising government revenue see Mair 1948 : 88.

(2) The Ordinance of 1918 was subsequently superceded by the Native Plantations Ordinance 1925-52, extracts from which are contained in Appendix E.

(3) The Ordinance prescribed that "half or any other proportion" of the crop was to belong to the villagers. In practice villagers were paid half the takings.

241 657 people probably preferred it anyway. He gives no evidence for the latter assertion. It seems equally possible that officials of the day considered the Papuan people to be "naturally" adapted to communal patterns of work.

The first action to implement the ordinance in the Northern District was taken in 1921 and 1922 when inspections were made by officials "with a view to plantations being established of such economic plants as will suit the soil and promise a profitable return" (P. A. R. 1921-2 : 23). Similar action was taken in parts of the Central, Milne Bay and Gulf Districts at the same time.

Acquisition of land

657 423 In 1921 the Crown began to purchase lands under the Lands Ordinance 1911-22 and to declare them under the Native Plantations Ordinance, as Native Reserves set aside for the purpose of Native Plantations. Between 1921 and 1925, 38 such plantations were declared in Papua (33 of them in 1922-3). Each plantation was to be farmed by a group of neighbouring villages. By 1932, however, 18 of the Orders in Council by which the plantations had been established had been cancelled (there were no cancellations thereafter). Of the remaining 20, 14 were located in the Northern District and the other 6 in other parts of Papua. With the exception of small extensions to several plantations, no further land was bought by the Crown for this purpose after 1925. The plantations established on Crown land in the Northern District are listed in Appendix A.[A]

In 1925 the policy changed to the extent that plantations were only established under the ordinance if people could be persuaded to set aside native land for the purpose. The Crown did not buy the land, and residual ownership was not challenged, but for such time as the land was proclaimed under the ordinance it could only be used as a native plantation for a particular group of villages. We have been unable to ascertain the reasons for this change of policy. Between 1923 and 1936, 75 plantations were proclaimed in Papua under this section of the ordinance. By 1934, 36 of the Orders in Council setting up the plantations had been cancelled. Of the remaining 39, 12 were located in the Northern District. They are detailed in Appendix B.[B] No further communal plantations were ever established.

A, [See Category 423, pp. 37-40--Analyst B, [See Category 423, pp. 41-42--Analyst]

425 The purchase documents list the names of the vendors, who were described as "sole owners" of the land concerned.(1) There was an average of five "owners" per block, with a range from one to eleven. All of them were men. From the sample checked it appears that not all members (nor even all male members) of the owning sub-clans were included, but rather the heads of the owning sub-clan and of component lineages. Moreover, some heads of neighbouring sub-clans which participated in the project, but were not members of the owning sub-clans, were included. This suggests that the people may have viewed the negotiation as a decision by the signatories and their descent groups to set the land aside for a particular purpose (with the consent of the occupying sub-clan), rather than outright sale by the occupying sub-clan.

Legally the blocks which were purchased belonged to the Crown, but the Orokaiva people do not admit either the sale or any other Crown rights. In the course of field work in 1963 we asked villagers at each of 12 blocks, to whom the land on which the coffee was planted belonged. Invariably we were told that it belonged to one or other of the local sub-clans. In three instances we suggested that it may have belonged to the Crown, but the people reacted so strongly that we did not press the point, (though the strength of their assertion may well have reflected their uncertainty about precise rights to the land).

423 At the time of purchase the officers concerned no doubt pointed out to the owners that the land would not be taken for use by the government, but would be set aside for the collective use of the villages concerned. The plantations were in fact established and it is understandable that the people consider that the landowners were merely granting joint usufruct to members of neighbouring sub-clans. The government has never asserted its legal rights to the abandoned plantations, and it seems unlikely that it will ever do so.

Planting under the ordinance

657
• 241 Whereas the Native Regulations had been implemented by the Resident Magistrates, provision was made in the

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[212]

(1) The vendors were illiterate and signed the documents by the putting of marks.

ordinance for the appointment of officers as "controllers of 657 native plantations". The first of these, Mr. G.H. Murray, 241 was appointed in 1920 to serve the whole Territory (P.A.R. 1920-1 : 28). It was not until 1923 that a permanent officer, Mr. A.T. Dawson, was posted to the Northern District. Neither officer had been trained in agriculture.

The people of the Northern District were reported to be receptive to the idea of having their own plantations and "practically no compulsion" was applied in getting initial agreement to the principle (P.A.R. 1923-4 : 16).

Planting began in 1923 and by 1925 fourteen of the 248 plantations had been planted. Owing to a delay in obtaining cocoa seedlings from Java, 30 acres of cotton were planted in 1925 (P.A.R. 1924-5 : 27). The cotton experiment was a failure and was not repeated. By 1926 there were only 50 acres 245 of cocoa, 10 acres of coffee and 6 acres of oil palm in the district.(1) [249] Eleven of the plantations were of cocoa, one of coffee [243] and two of oil palm. A little rice was also tried. The cocoa, oil palm and rice were soon abandoned by both government and the people owing to a drop in prices, and only the coffee was persevered with.

In 1926 or 1927, a further 116 acres of land were 245 cleared for coffee under government instructions, but the rate of expansion declined markedly thereafter. By 1936 there were 18 plantations totalling 242 acres under coffee in the Orokaiva area. 189 acres were then in bearing and the rest were expected to begin bearing by 1938. Plantings ranged in area from 4 to 30 acres.

Every able-bodied man between the ages of 16 and 36 245 years who lived within five miles of a plantation (except those 466 employed by government, missions or European plantations) was required, by regulations under the ordinance, to work 60 [651]

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(1) This figure included some private plantings in addition to those under the ordinance - P.A.R. 1926-7 : 10. Coffee seed was supplied from the government station at Higaturu.

245 No payment was prescribed, and none was made for carrying
466 from the plantations to the depot at Higaturu. Sometimes payment
was made for carrying produce the 16 miles from Higaturu
[465] to the port (usually in twist tobacco according to informants),
but at other times persons convicted of breaches of the ordinance
[492] were required to carry as punishment. Mules were
later introduced to carry the produce from the factory to the
[493] port, and in the late 1930's a truck was acquired to transport it
from Popondetta to Sananda. The mule train was still used
between Higaturu and Popondetta until 1940.

245 Official reports of the period consider the reluctance
of the villagers to have been due either to a lack of understanding
177 of the benefits they would derive from the scheme or to
innate laziness. C. T. Wurth, who was Resident Magistrate in 1926, considered that the people "had not grasped the advantages of the plantation and the benefits they will eventually reap" and noted that many men from the villages with plantations had gone off to work as labourers elsewhere (P. A. R. 1925-6 : 50). His successor described the "toil and disappointments" entailed in supervising the plantations and stated that the village people "have to be driven to it by the fear of gaol".(1) He was aware that there was no cash return during the first four years after establishment of plantations and hoped that attitudes would change as soon as the trees came into bearing and income was derived.

●241 As noted on page 7, half the produce of the plantations
was to belong to those who produced it and the other half to the
government. But in practice in the Northern District, producers
were required to deliver all produce to the government
[651] depots at Higaturu, Popondetta and Buna.(2) The half of the

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(1) P. A. R. 1926-7 : 53. A later magistrate followed a policy of "incessant talking to the village councillors ... for even if they do not think his [the magistrate's] advice worth following, they may be glad to take it as the only means of keeping him quiet" - P. A. R. 1933-4 : 29.

(2) The main depot was at Higaturu until 1941, but in that year new machinery was installed at Popondetta to handle pulping, drying and hulling. (Since 1933 the coffee had been shipped in the parchment stage to Port Moresby where it was hulled at the government rice factory). Before the Higaturu depot was closed, however, war broke out and all three depots were destroyed.

651 [241] proceeds to be retained by the government was paid into the Native Taxation Account (which was composed of revenue from head tax and native plantations). Average annual government revenue from the plantations was £1,082 and from head tax £14,003. After costs of collection had been met the balance remaining in the Native Taxation Account was transferred to two funds which were entitled, somewhat inaccurately, the Native Education Fund and the Native Benefits Fund.

657 241 [871] Hulling, marketing and administrative costs incurred in running the plantations scheme were paid from the Native Education Fund. The same fund provided a coffee pulping machine for each of the plantations which was more than about two hours walk from Higaturu, the produce of the closer gardens being pulped at Higaturu Station. In fact no money was spent directly on native education in the Northern District, though some small subsidies were granted to mission schools. The Native Benefits Fund provided for the salary of a Government Anthropologist, medical services, bonuses to large families and other miscellaneous expenses. Only about a quarter of the money in the two funds was spent on education (all in the form of subsidies) and much was simply left to accumulate. [651] When the war broke out there was an unspent balance of £26,199 in the Native Education Fund. The whole plantations scheme (including Native Education and Native Benefits) was administered by the Director of Native Taxation.

465 [211] The producer's half of the income from the coffee was paid, not on delivery, but at the end of each year. The official in charge of the scheme visited each village to make the payments. The ordinance required that payment was to be made in proportion to days worked and, as the village constable who was in charge of the plantation was almost invariably illiterate, some of them kept an "attendance stick" for each man. A notch was cut in the stick for each day of absence other than that caused by illness or the death of a close relative. [212] When the government officer visited the village to make the payments the constable produced the attendance stick of each man as he came up for payment. Some constables relied on memory to inform government officers of absentees, but the few literate ones (e.g. at Sombo) were provided with attendance books.

Production and income

433 While official reports give laziness or misunderstand-
241 ing as the reason for the lack of willing co-operation with the
scheme, the reason given today by the people themselves is that
the income was inadequate for the effort required.

Table 1 shows the total production of coffee from
plantations established under the ordinance in the Orokaiva area
for the ten year period 1931-40, and the amounts paid to pro-
[435] ducers for it. The price per pound has been calculated and
ranged from 4.5 pence (in 1932) at the highest to 2.1 pence (in
1938) at the lowest. The average price for the period was 2.6
pence per pound.(1)

433 Table 2 shows that output per acre of land planted in
coffee under the scheme averaged 681 pounds, which is a rela-
434 tively high yield. At 2.6 pence per pound this would have given
an income of £7.7.5 per acre. The total work force on all the
245 plantations is estimated to have been about 700, so payment
[465] would have averaged £1.11.0 per worker per year, or less than
2 pence per day worked. The 15½ acres of coffee in the Ongoho
block(2) would, assuming average yields, have given an annual
income of £114.5.0, or just over £1.0.0 per worker, but in-
formants today maintain that payment at Ongoho was usually 8/-
to 12/- per man per year with young lads being paid 5/-.
[464] Only on one or two occasions did the payout exceed £1. The
total labour force in the nine villages which participated in the
Ongoho block was probably close on 100 and yields per acre
465 were apparently lower than average. Enquiries at other com-
munal plantations show that higher prices were paid in places
where a smaller labour force was working an equally large
[466] area. In Hohota, for example, £6 to £9 was paid per man in
some years, but there the hours of work are said to have been
6 a.m. to noon six days a week, plus afternoon work at harvest-

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[439] (1) The world trade depression had begun about the time the first coffee was coming into full production. The crop was marketed in Australia where it met strong competition from Java coffee.

(2) Our measurement of the planted area shows it to have been just over 15½ acres, though the area gazetted was only 15 acres.

[TEXT CONTINUED ON PAGE 17]

Post-war community plantations (1945 - 62)

177 Shortly after the outbreak of war with Japan, government services were reduced to a minimum, coffee buying ceased 657 and the community cash crop gardens were soon abandoned. [241] The Orokaiva area became the scene of intense fighting between Japanese and Australian-American Forces during 1942 and 1943 and civilian government was not restored until 1945. No further Commissioners for Native Plantations were ever appointed but towards the end of 1944 an Agriculture Officer (Mr. F. Shaw) was posted to Higaturu. One of his tasks was to [461] get the pre-war plantations into production again. Most informants today say they had no wish to resume work on the plantations owing to the low payments made pre-war, which they assumed would continue. Their association with Amercian forces had led them to consider their labour to be worth con- [466] siderably more than pre-war rates. However the military administration (A.N.G.A.U.) was then still in charge of the Territory, and they were instructed to recommence work on the plantations.

245 The pre-war system whereby every man worked on the coffee each morning from Monday to Friday was resumed, 466 though supervision was transferred from the village constable to a "coffee boss", one of whom was appointed by the government to oversee each plantation.

Penal sanctions were less severe than pre-war, the usual punishment for failure to attend work being one month's imprisonment instead of three, but before long the sanctions 465 were relaxed and few people were convicted. Income was [434] higher, for whereas before the war the villagers were paid only half of the proceeds of the crop, after the war they were paid the full price.(1) Ongoho people inform us that annual payouts after the war were £6 to £9 per man per year, and in addition

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(1) The Native Plantations (Papua) Ordinance of 1952 provided for the total value of the crop to be paid in cash to the producers. In practice, the policy had been followed for several years before that.

the men who carried the coffee to Higaturu each Saturday were 465
each given a stick of tobacco. By 1950 the basis of payment had
been changed and producers were paid immediately and in cash
for their produce.

The post-war drive did not last long and when official 433
pressures were relaxed production dropped markedly. During
1949-50 extension staff made a further attempt to revive the 241
scheme: seven plantations in the Higaturu area were fully rehabilitated
and similar work was proposed for the plantations
east of Popondetta. New processing equipment was purchased 731
and a new coffee factory built at Higaturu, but it was hardly
completed when Mt. Lamington erupted early in 1951 destroying 433
the factory and many of the plantations as well. Production 241
from the plantations scheme ceased as a result of the eruption,
but it is doubtful whether it would have continued for long in any [433]
case. The price was low, (1) no external sanctions were imposed
(and the people were not permitted to impose their own
sanctions) and in many instances there was dispute over the
shares to be given to landowners, supervisors, and others. In 433
1955 extension staff made a third and final attempt to revive the 241
scheme, but it too met with little long term success.

No precise production figures are available for the plantations scheme in the Northern District, but as this scheme produced most of the coffee exported from Papua, total exports from the colony give an indication of the pattern which applied in the Northern District. These are listed in Table 3 below.

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(1) In 1950 coffee was being bought in cherry at 2d per pound which is equal to about [435]
10d per pound for parchment coffee. Data published in P.A.R. 1949-50 : 17 show
that 40,160 man-hours were worked on the 56 acres of coffee then in production and
that £767. 12. 3 was received from coffee sales. Making no allowance for establishment [465]
costs, this represents 4½d per hour worked.

245 ment coffee pulping machine was withdrawn. Supervision of
the coffee was taken over by the village constable (who had been
in charge of the coffee before the war) but no records of
attendance were kept. Later, at the constable's suggestion, a
Patrol Officer is said to have appointed one Haruma (who is a
classificatory brother of the constable's wife) as coffee boss.
This must have been an unofficial appointment as he was not
[578] paid. There was by this time a continuing dispute about the
distribution of income from the coffee.

The Hoiwo'undi sub-clan, on whose land the Ongoho
578 coffee was planted, claimed a larger share of the proceeds
423 because the land was "theirs". As no agreement was reached,
the Hoiwo'undi forbade members of other sub-clans to enter the
614 coffee gardens. This prohibition was respected even though
many people felt it to have been unjust. Legally of course
neither Hoiwo'undi nor any other sub-clan had any right to the
land, because the whole garden area had been purchased by the
Crown in 1922 and set aside as a reserve for the purpose of a
native plantation in 1923. But security of tenure is dependent
much more on beliefs than it is on law and in fact the people do
not concede the government's right to the land. All are agreed
that it is Hoiwo'undi land, though the other sub-clans consider
that as everybody cleared the bush and planted the trees, it is
unjust that Hoiwo'undi should have denied them access. No-
●[241] body, however, seems to deny their right to do so. In fact
Hoiwo'undi people had been using the front part of the area for
a food garden before the community coffee plantation was es-
tablished. One family of Akute'undi sub-clan had also been
gardening there with the approval of Hoiwo'undi. The coffee
boss (Haruma) was also the leader of the Hoiwo'undi sub-clan.

245 For a time the community garden was abandoned
altogether, but later some Hoiwo'undi people harvested coffee
there spasmodically. The income was shared within Hoiwo'undi.
No weeding, pruning or other maintenance work was carried
73 out at this period. At the time of the Mt. Lamington eruption
241 in 1951 all work ceased. The government coffee factory and
buying centre was destroyed and so were several of the com-
munity plantations.(1) Due to the trauma caused by the disaster

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(1) In fact the coffee trees grew again from seed which had been lying in the ground and which was not affected by the eruption. These self-sown trees have not been tended or thinned, however, and their productive potential today seems to be very low.

and a lack of buying facilities, no coffee was picked at Ongoho until 1952. 241 [731]

In that year a local company (R.F. Bunting & Co. Ltd.) began buying coffee. The market price was higher than it had been when the government was buying (i.e. up to 1951) and it continued to increase. Some Hoiwo'undi resumed harvesting coffee from the Ongoho community block, but there was constant tension between them and the other sub-clans, Akute'undi in particular. Only a little of the coffee was picked, most of it by the village constable and the coffee boss and their close kin.(1) In 1953 they took two sacks of coffee to the Department of Agriculture in order to buy a coffee pulping machine worth £21.0.0. The machine did not function properly and after several years a passing Patrol Officer took it to Popondetta for repair. The Patrol Officer was later transferred and the machine was never located again. The owners still harbour a grievance on this account. [578] [258]

Agricultural extension services in the district were expanded during 1955-6 at the same time as the Higaturu Local Government Council was being formed. (The council area embraces all except one of the community plantations). Although agricultural policy at that time was to encourage future planting by individuals rather than groups, efforts were made to increase production from existing community plantations. Extension workers visited every community plantation and wherever possible enlisted local co-operation to have undergrowth cleared and trees pruned. Not all the people at Ongoho worked, but factional differences were sufficiently contained for several sub-clans to work together under the supervision of extension workers. Once the major task was completed and the 654 245 245 578 [654]

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(1) The village constable was a member of Akute'undi sub-clan but was married to the most senior woman of Hoiwo'undi sub-clan. She has a very forceful personality, is married within her own village and is the only member of her family to have borne children. They will therefore acquire some land rights from her. The land on which the community coffee is planted was previously used for gardening by her father and her brothers. Her husband was village constable and he and his lineage pick coffee, but other lineages of his sub-clan do not and he is as forceful as his wife in denying their right to do so. In fact the constable and the coffee boss (who is a classificatory brother of the constable's wife) seem to have co-operated throughout to maximise their joint advantage. [425]

Community rice and cocoa projects

797 In 1948, the Christian Co-operative Movement was
formed by Father Clint of the Anglican Mission at Gona. The
movement spread spontaneously throughout the Orokaiva
country, though most of the co-operatives were only nominally
474 linked to the mission. (1) The main activity of the co-operatives
[241] was the growing of rice, but some grew subsistence foods also,
and others made copra. Although the movement was referred
[258] to as a co-operative, its agricultural activities were in most
cases communal: all participants were supposed to work at the
same time and to undertake whatever work was allotted to them
by the group leaders, and the benefits derived were to have been
shared equally. Moreover, at least some villages required all
resident adult males to participate in the scheme.

621 In most instances the village worked as the unit of
production, but in some cases several neighbouring villages
[243] worked together. Some large villages were divided into one or
more groups for the purpose of the community rice garden.
Each group had a committee of management and a chairman.

461 In general Monday and Tuesday of each week were set
aside for work on the community gardens. Official patrol re-
794 ports noted that the movement had taken on many aspects of a
cult. All stages of work were associated with an unusual
amount of religious activity and the tools and buildings of the
co-operatives were treated with great veneration. Keesing
(1952 : 7) speaks of an "absorbing mystical context" and of
rumours that Europeans would leave Papua as a result of the
co-operatives. An official observer stated that the people
considered "mere participation in the co-operatives would,
797 magically or mystically, quickly raise their status in all re-
spects to that of Europeans". Orokaiva people have pointed
461 out to us that cash cropping projects initiated by the govern-
ment had invariably failed. They felt that a mission project
might be more successful. Moreover, whereas they were un-
certain of the government's motives they felt the mission to be
"on the side of the people", for by introducing them to co-

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(1) The co-operative movement in this area is described in more detail in Dakeyne, 1963.

operatives they had given them the key to European prosperity. 461

Local enthusiasm was strong and a large acreage of [797]
rice was grown. However, no marketing facilities had been
provided and although the mission had promoted the crop mainly 243
to supplement traditional subsistence foods, most Orokaiva 433
seem to have regarded it as a cash crop. They already had a plentiful range and volume of subsistence foods, and rice was not only harder to grow but also more difficult to prepare than the existing crops. Most of the rice grown was neither sold nor eaten, but was left to rot in the storehouses.

It is interesting to note that at Ongoho, despite the unfortunate experience with other community crops, all inhabitants of the same nine villages came together to plant a single rice plot. The project was organized by Haruma, the coffee boss, and the rice was planted on the land of the Akute'undi sub-clan. The crop was planted in 1949, and the rice was stored in a house built for the purpose. None of the rice was sold, a little was used for food, but most was left to rot. The experiment was not repeated. When asked why everyone combined to grow the rice instead of growing it individually, the people claimed that they had not realized at that time that cash crops could be grown by individuals. This view may seem incredible to a European, but we have heard it quoted in many parts of the Orokaiva area. Their whole experience of cash cropping had been of large scale enterprises, whether private European plantations, government plantations (which were established adjacent to many district headquarters), compulsory plantings under the regulations, or communal plantations under the ordinance. The introduction in 1955-6 of the concept of cash cropping by individuals was in a very real sense revolutionary.(1)

The idea of community economic activity was again 434
given a boost in 1949 when war damage compensation was paid 454
out. A small proportion was paid in cash, but most was de-
posited in savings bank accounts. Many government officers 474
then in the area noted that the money was being used to buy

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(1) It must be pointed out, however, that among the Orokaiva food gardening had always been undertaken by individuals. [241]

474 foodstuffs and for ceremonial exchanges and some urged the people to deposit their compensation money in a central fund for use by the community as a whole. Many leaders took this advice and collected large sums for the co-operatives. Some of the money was kept in the villages, but some was contributed to central funds which were held on a tribal or sub-tribal basis.

Few of the leaders had the technical knowledge to know how to handle the funds or to apply them to productive projects, and much of the money was dissipated in unproductive
[657] activities. About 1950 government Co-operative Officers were sent to assist the establishment of formal co-operatives and to save the many existing informal co-operatives from disintegration with consequent public loss of faith. The officers were able to make headway in some instances, but in other cases the funds were already exhausted and the people disillusioned. In cases where the funds remained, the government insisted on their being handed back to the original contributors before any official co-operative was formed (Belshaw, 1951 : 250).

657 Efforts to increase indigenous participation in commercial agriculture in the Northern District in the post-war
241 decade had met with little success and in 1954 the Department of Native Affairs resumed pre-war patterns of promoting commercial agriculture. Additional police were stationed in the area, particularly on the inland side of the Kumusi River but to
[466] a lesser extent among the Orokaiva also. One policeman was based at each of a number of villages and each village was required to clear a community garden for cocoa planting.

The Department of Agriculture staff did not favour any extension of community planting and put its emphasis on individual cash crop gardens but, in the early stages at least, this action was strongly opposed by both the mission and the
[777] patrol staff. Missionaries who were involved feared that individual cash cropping would lead to abandonment of the villages as each individual would probably want to live near his own cash crop garden. They felt that this would result in a reduction of religious and educational activity and may lead to a resurgence of non-Christian practices. Patrol staff too opposed individual plantings at that time, in some instances it seems because of an erroneous notion that traditional agriculture was

a communal task.(1)

Most of the communal cocoa gardens in this area were later abandoned. Some (such as Hojavasusu) were divided into individual lots and continue to produce. A few others are still functioning to a limited degree, but none are now operated on a communal basis.

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(1) By about 1956 the new patrol staff had come to favour individual plantings and this policy has been followed by both departments since then.

Conclusions

433 •241 All the attempts to promote communal cash cropping among the Orokaiva have been economic failures. There is no evidence to suggest that they have been successful in any non-economic sense. Each of the ventures has been associated with problems of land tenure, work organization, income distribution and motivation. We will deal with each of these problems in turn.

423 [614] Problems of land tenure: When a sub-clan or other descent group has set aside land for use by a larger body which includes other descent groups, the donor descent group is recognized in terms of traditional culture as having residual rights to the land. These rights may still be recognized by the community even if they have been abolished by legal action in terms of administrative procedures (see pages 10 and 25).(1) A This is particularly so in cases where the setting aside has been the result of a degree of persuasion which appears to the people as compulsion. Strict government supervision can protect the legal rights but, if none of the parties are particularly anxious to have them protected, the supervision needs to be constant and [461] strict to be effective. Even then the results are unlikely to justify the effort required to effect the controls, for supervision by force results in very high overhead costs and seldom motivates workers to maximise output.

241 614 [592] We do not know of any instance of communal planting of cash crops by a single descent group on the land of that descent group. Traditionally all planting was organized at the level of the primary household, with some reciprocal assistance from other households for specific tasks at irregular intervals. If a single descent group did undertake clearing, planting and harvesting of cash crops jointly, tenure problems would be un-

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(1) A similar phenomenon was observed in the Ambenob scheme near Madang where the Administration purchased land from the villagers and leased it to the Local Government Council for sub-lease to individual farmers for cash cropping. The purpose of the scheme was to give security of tenure to the individual, but as both vendors and sub-lessees recognized some degree of residual right as remaining with the vendors, a sense of security has not been achieved. This is one reason why sub-lessees are in fact planting their cash crops more on their traditional lands than on their sub-leases.

A, [See Category 423, pp. 10, 25--Analyst] likely to emerge. Problems of work organization and income distribution may nevertheless arise.(1) 241 614

Problems of work organization: The communal plantations almost all involved several unrelated descent groups which traditionally recognized no single leader. The Orokaiva did occasionally form larger ad hoc groups for warfare and sometimes for forest clearing, but these were temporary associations directed to the achievement of a short term goal. This of itself does not preclude the formation of new and larger groupings with unitary leadership provided there is either a strong desire for group action (and the necessary institutions to direct it), or strong external sanctions to enforce it. [726]

The earliest communal plantings of coconuts and rubber by the Orokaiva were carried out under instructions from officials and sufficient pressure was exerted to ensure compliance. The pressure was not, however, maintained and the coconut and rubber trees were little cared for after planting. Nor was harvesting for market enforced. Prices were low; the coconuts were seldom made into copra and the rubber was never tapped until the time of the war.(2) 245 249 657 466

The working of the coffee planted under the Native Plantations Ordinance was strictly supervised. A village constable was in charge of each local group, the European officer in charge patrolled the area regularly, and defaulters were severely punished. The communities regarded the whole operation as one of oppression by the government. During the period that government sanctions were reduced and finally withdrawn, coffee prices were high (more than ten times higher than immediately pre-war). Many people therefore wished to continue working the coffee gardens, but the community was not traditionally equipped with adequate sanctions to ensure that individuals did their share of work, and the law specifically forbade the exercise of sanctions by any indigenous individual or group. 245 657 466 [626] [461] [626]

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(1) Since writing this we have been informed of a small (3 acre) communal tobacco-growing project which began at Soroputa in 1948 on the land of a single descent group. It was reported to have functioned efficiently until it was destroyed by the Mt. Lamington eruption in 1951. [249] [731]

(2) For details of the war-time rubber-tapping scheme see Rimoldi, 1964.

241 65 [466] [625] [177] As Mair (1948 : 85) has noted, the fact that officials could fall back on compulsion gave them no encouragement to considering any alternative approach. The European officer's link with the people was through the village constable, and from what the Orokaiva tell us this line of communication operated in one direction only, for most constables felt that it was improper to query instructions given by Europeans, or to make suggestions to them. Not only was no attempt made to create local institutions which could have carried responsibility for community projects, but the imposed organizational structure did not provide the people with an acceptable model on which to fashion any new local institution. The vesting of all powers of sanction in the central government, moreover, forestalled the possibility of their spontaneous emergence.

465 212 Problems of income distribution: While the Administration paid each individual separately, no overt problem arose, but when government ceased buying and the coffee was sold to a trading company a lump sum was given to the person or persons who brought it in, usually the local coffee boss. Relatively few Orokaiva were literate (among the Asigi there were none) though it may have been possible to have made equal payments to all persons. However, as the community was unable to enforce equal work this was not feasible. Had there been a sufficient standard of literacy it may have been possible to operate on co-operative rather than communal lines (i.e. making payment in terms of work contributed) but in fact few people had the necessary degree of literacy and almost none had any knowledge of book-keeping.

461 [466] [433] Problems of motivation: The Orokaiva were never *willing participants in any of the communal schemes* (with the exception of rice growing in 1949). Some of them may have begun some of the projects willingly, but continued operation was only achieved by force. The money incentive was quite inadequate: most of the schemes produced no income at all, and those that did gave less (in cash and kind) than employment elsewhere. As already noted in the section on work organization, there was no social incentive to continued production.

241 It has been suggested that the pre-war community projects were merited in that they introduced the people to the

241 [245] agricultural techniques of cash cropping and to regular patterns of work. It is true that most of the individual plantings of coffee since 1956 were made with seeds taken from the old community blocks where the techniques of coffee husbandry had been learned, but it was there also that the people had acquired their distaste for cash cropping.

121 [241] The fact that all attempts at developing communal cash cropping among the Orokaiva have failed does not necessarily mean that communal planting is never practicable. What it does indicate however, is that to be successful, communal farming like any other farming system, must be coupled with appropriate organizational structures, sanctions and incentives as well as with extension, processing and marketing facilities.(1)

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[433] [245] (1) Individual small-holdings do not of themselves lead to higher output. Since 1956, the nine Asigi villages which participated in the Ongoho community block have been encouraged to plant individual cash crop gardens. To date only 33 gardens have been planted (all of coffee). They cover only about 9 acres of land and contain 4,209 trees. Most are little better tended than the community block and fifteen are completely abandoned. Low price, distance to the market and lack of extension services seem to be responsible.

Appendix E

Extracts from Native Plantations Ordinance 1925-52 and subsidiary enactments

"4. (1) The Lieutenant-Governor may ... direct that any land acquired or resumed under the provisions of the Land Ordinance 1911-24 ... shall be a native plantation 423 657

(2) The Lieutenant-Governor with the consent of the native owners may ... direct that any land shall be a native plantation ... and shall remain so until the Lieutenant-Governor otherwise orders but the land shall remain the property of the native owners.

4. (A) The Lieutenant-Governor may appoint officers to carry out the provisions of this ordinance. Such officers shall be known as controllers of native plantations ....

5. (1) Statutory workers[1] shall work for such number of days each year as may be prescribed .... 466 [651]

(2) For cultivation work ... the Lieutenant-Governor may ... remit tax.[2]

8. (1) Of the total annual produce of each native plantation one half or such other proportion as the Lieutenant-Governor may order[3] ... 241 657

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[1] Defined as "every able-bodied male villager" aged between 16 and 36 years excepting government or mission employees and indentured workers.

[2] Order in Council of 2.7.1924 ruled that no tax would be payable by any villager who worked for two months per year on the plantation.

[3] No proportion was ever gazetted but it is understood that one half was invariably taken.

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(a) may be distributed in kind by the Government among the villagers ...

(b) may be sold by the Government on account of the villagers ...

(c) may be purchased by the Government from the villagers ...

423 9. The remainder of the annual produce of each native plantation ... shall be the property of the Crown".

466 Native Plantations Regulations 1926, made under the above ordinance, prescribed that statutory workers had to work sixty days per year on their plantation. It also provided that "supervision and regulating native plantations and the cultivation thereof" was vested in the Director of Native Taxation.

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Order in Council of 20.9.1926 made the following provisions for the distribution of the villagers' share of income derived from native plantations:

"1. That each one-half or other proportion of each year's produce which is the property of native villagers ... shall be divided among the statutory workers and voluntary workers in the proportions that the number of days which each of them respectively has worked during the year bears to the aggregate number of days which all of them have worked on the native plantation in the cultivation thereof ....

Provided that where any statutory worker (who has by death or age ceased to be such) or where any voluntary worker (who has ceased to be such or has died) has previously worked on a native plantation for any time during any year during which the prescribed plant cultivated thereon has not come into bearing or is unproductive then he (or, in case of his death, his widow, or in case of her death, his child or children whilst under the age or apparent age of sixteen years) shall be entitled to receive during the first productive year of the native plantation such part of the produce thereof as is the property of the villagers as the proportion which the number of hours he worked (in his first year of work) whilst the native plantation was unproductive bears towards the total number of hours which all statutory workers and voluntary workers worked in that year and so on yearly mutatis mutandis until he (or his widow or children as the case may be) has received such part of the produce in respect of each unproductive year he worked on such native plantation. 465 466 434

2. That instead of allotting the proportion of the annual produce of a native plantation in the manner set out in the proviso to Paragraph 1 hereof the nearest Resident Magistrate ... may be required by the Director of Native Taxation to confer with the villagers in their village and ascertain what other scheme of allotment of such annual produce they themselves consider to be preferable .... The Magistrate shall report the result of such conference to the Director who shall forward it with any observations he desires to make to the Lieutenant-Governor who may approve the scheme preferred by the villagers with or without modification whereupon that scheme of allotment as approved shall be followed in relation to such annual produce instead of the scheme ordered in the said proviso. 241 657

Officers to be instructed to adopt 2 when practicable."

Native Plantations (Papua) Ordinance 1952 provided that the villagers would own the whole of the produce of the plantation instead of half as formerly. This ordinance also did away with the earlier requirement that villagers work 60 days per year on the plantation, and cancelled the provision whereby persons who worked on plantations for two months were exempt from tax. 657 [423] [466] [651]

Appendix F

The Orokaiva villager's experience of cash cropping

241 While the writer was conducting research into com-
munal plantations in some villages, an assistant, Mr. Edric
177 Eupu, visited others. The following brief extracts from two of
[114] his preliminary reports indicate the natuve of the villager's ex-
perience of cash cropping, and help to explain the current lack
of enthusiasm on the part of many Orokaiva for further experiments.

Ahora Communal Garden

Before the war there were four cash crops planted at Ahora: coconut, cotton, cocoa and coffee. The coconut was planted on two clans' land. The names of the two clans were Huruba and Gambe. There were three villages took part in the work. The names of the villages and clans who took part in the work were ....

245 They planted coconuts but did not make any copra.
[258] [There was no market for it at the time]. The coconut was
ready to make copra, but the Government officer at Buna told
the people to plant the cotton. The cotton was planted on Gambe
248 clan's land ..... The people worked one year for the cotton
465 without pay .... When the cotton was ready .... they picked it
and took it to Buna (government station) .... and they got paid.
The pay was 1/- for each man in the three villages for the work
they had done for the cotton. After they got the pay the work
on the cotton stopped.

245 Then government told the villagers to plant the cocoa
and they planted. It was planted on Gambe clan's land. The
cocoa bore and they took the pods to Buna. Government paid
for the pods [but the pay was insufficient] .... Then the coffee
was planted on Huruba clan's land .... The people used to work
[465] every day .... The pay for the coffee was about 5/- to every
man each year. While they were still doing this the war came.
[133] After that they did not work until Mt. Lamington erupted.

Hamburata Communal Garden

Before the war there were four cash crops planted at 241
Hamburata: rice, coconut, palm oil and coffee. The rice was
planted on Atupa clan's land. Five villages took part in the
work .... There were 29 clans .... The villagers worked for [465]
the rice for one year without any pay. The rice was harvested
in bags .... The people brought the bags of rice to Buna but the [243]
government did not pay them for the work they did on the rice.
They worked for the rice for one year only ....

The second crop planted at Hamburata was coconut.
The coconut was planted on land of Atupa clan .... The coconut
plants were still young when the villagers were told by the
government to plant another crop. The crop was palm oil .... [249]
The palms were planted on Haumepa clan's land. The villagers
planted the oil palm and looked after them for one year and the
government told the people to plant another crop. The other
crop was coffee.

The coffee was planted on Seharipa clan's land 245
They worked every day .... They got pay once in every year.
The government officers used to come to the village. The [625]
government used to send police to the village to look after the
people to work on the coffee .... When the war was near the
government did not send the police to the village for this work.
After that all the people in the village stopped work .... After [133]
the war they did not work on the plantation until the Mt Lamington eruption. The coffee was near the Ambogo river so the
river was flooded and washed the plantation away ....

128 Besides data collected on a standard series of topics investigated in the related series mentioned above, our report also includes discussion of the relationships between land tenure and land use on the one hand and residential and local organization on the other - questions which have been raised by anthropologists and administrators writing on this Orokaiva area.

731 178 [623] The population displaced and resettled after the eruption were almost all mountain Orokaiva; one legacy of these events was the protracted complication of land tenure, which some of the people later found an obstruction when they were caught up in a general increase in enthusiasm for cash-cropping. This coincided with the formation of the Higaturu Council whose membership consisted in large part of the mountain Orokaiva.

657 178 Community development plans made after the eruption[1] were never successfully launched, but the tenure situation in the council territory and specific areas of acute land-consciousness are the problems which patrol staff felt made it essential to regularize the tenure of cash crops at this time.

241 178 [361] In 1951 Keesing expected that the marked trend towards larger settlements witnessed after the eruption would, as a matter of course, be reversed as circumstances permitted villagers to revert to their normal horticulture involving frequent rotation of cultivated areas; paradoxically, it was in view of the spreading enthusiasm of the Orokaiva for a more intensive, commercial agriculture about 5 years later, that some mission staff anticipated similar fragmentation of the same large villages.

361 178 [121] Considerable topical interest is given to the question of the connections between settlement patterns, agricultural systems and title to land by current changes in the Orokaiva area which have implications of further radical adjustments in residential patterns. In a recent development a few local government councillors had initial success in advocating the consolidation of villages apparently as a means of establishing an economic base for the provision of local services or amenities. Members of Sivepe and other villages decided to rebuild together on land near Sasembata (E. Waddell: personal communication). Staff of the mission have for many years favoured this type of settlement among its Orokaiva [657] parishioners.[2] Although, with consistent effort, patrol staff of the Department of District Administration achieved the periodic amalgamation of pre-eruption villages, the department did not endorse the recent move and pointed out that councillors acted independently of any decision of the council or advice of its executive.

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[1] Mentioned by Belshaw 1951.

[2] See Crocombe 1964:31.

433 The C.S.I.R.O. (1954:12) reported that a wide range of annual and perennial crops which will grow at altitudes up to approximately 1,500 ft and do not require a marked dry season could be grown successfully. The report commented that the whole land system is a very good agricultural area and that this is reflected in the relatively dense population,

> a factor which under the present system of native agriculture will influence the extension of European agriculture. The potentialities of the area, however, far exceed the present land use, which means there is scope in this area for the successful application of extension work directed to the improvement of native agriculture and horticulture.

137 The natural vegetation of the area is a rainforest climax (Pometia pinnata-chisocheton sp. Alliance), of which very little remains. A belt of primary and secondary rainforest separates the settlements on the mountain slopes from their northern neighbours but the area south of this belt is mostly covered with more recent secondary growth in various stages of regeneration after cultivation. Isolated patches of 'kunai' grass occur (mainly Saccharum spontaneium, with some Ropbelia, Imperata spp.)[1] but their area is insignificant by comparison with the grasslands found on the Orokaiva plains.

b. The cultivation cycle

132 Over a period of 8 years the average monthly rainfall has ranged from 9.6, 7.9 and 8.2 inches in June, July and August (when rain falls about 15 days per month) to 20.9, 16.8 and 17 inches in December, January and February (with 22 wet days per month). The coefficient of seasonal variation used by Brookfield and Brown (1963:20) indicates only slight seasonal variability in the area.[2] An occasional brief drought is possible at any time, but with good soil, and no marked dry season, conditions for the growth of subsistence crops are usually favourable throughout the year and new gardens can be made as needed.[3] [241]

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[1] District Agricultural Officer: personal communication.

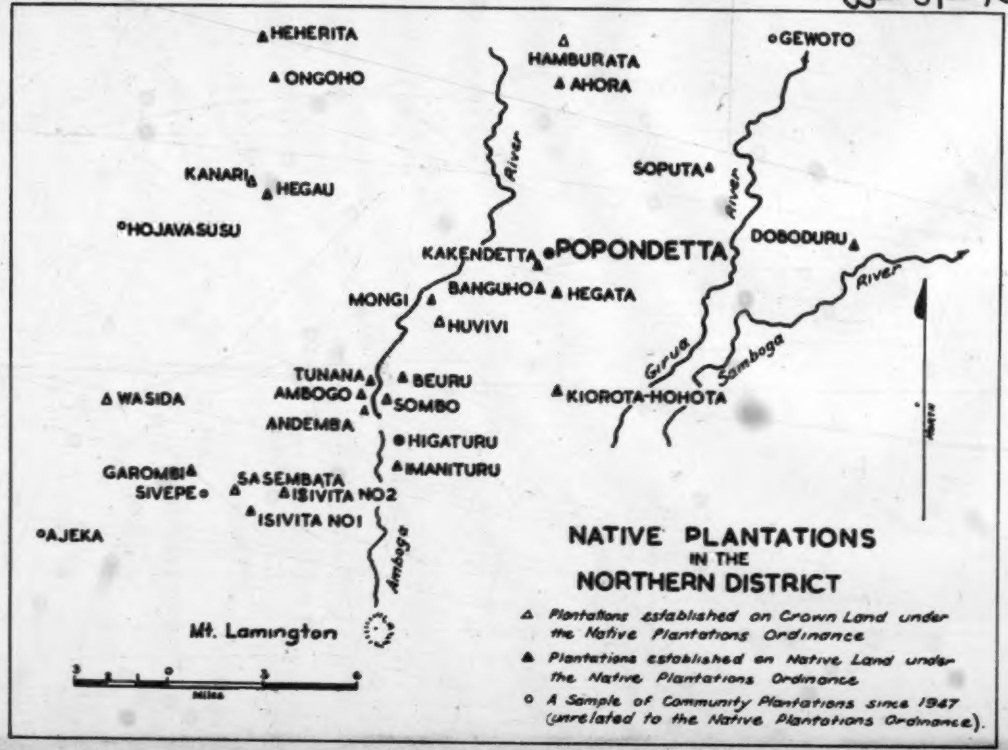
[2] The coefficient of seasonal variation was 0.30. This measure is obtained by calculating from rainfall figures the standard deviation of monthly means from the mean of the monthly means and then dividing the standard deviation by the mean of the monthly means.

[3] We found no effects in this area of the rainshadow zone referred to by Keesing, 1951:6.

102
131
245
241
133

6: Crocombe E-4,5 (1963) 1964 OJ23 Orokaiva OJ23

[end map]


HEHERITA
ONGOHO
HAMBURATA
AHORA
GEWOTO
River
KANARI
HEGAU
HOJAVASUSU
SOPUTA
River
DOBODURU
KAKENDETTA
POPONDETTA
MONGI
BANGUHO
HEGATA
River
HUVIVI
Girua
Samboga
TUNANA
BEURU
AMBOGO
SOMBO
KIOROTA-HOHOTA
WASIDA
ANDEMBA
HIGATURU
IMANITURU
GAROMBI
SASEMBATA
SIVEPE
ISIVITA NO2
ISIVITA NO1
AJEKA
Ambogo
Mt. Lamington
3 2 1 0 3 6
Miles
North

NATIVE PLANTATIONS IN THE NORTHERN DISTRICT

△ *Plantations established on Crown Land under the Native Plantations Ordinance*

▲ *Plantations established on Native Land under the Native Plantations Ordinance*

○ *A Sample of Community Plantations since 1947 (unrelated to the Native Plantations Ordinance).*

241 There is, however, a slight seasonal variation in the rate of agricultural activity. There is no correlation between the various phases of gardening activity and the seasonal variations in weather conditions, such as is sometimes found among shifting cultivators,[1] but the anticipated climate may determine the extent of new cultivation carried out at a particular time. More new gardens are made about the start of the season of heavier rains than at any other specific time of the year (cf. Williams 1930:144).

Decisions as to the type of garden work to be undertaken in the immediate future take account of suitability of current weather conditions. For instance, most villagers took the opportunity offered by a long unseasonal dry spell during the last weeks of our survey, at the time which would normally have been the height of the wet season, to make extensive clearings for new gardens to ensure a more continuous supply of food.

The natural high fertility of the ash-agglomerate slopes of the volcano is maintained under the system of short-fallow shifting agriculture. Gardens are small, scattered and irregular in shape. Usually each area is worked with varying intensity for only 18 months. General seasonal conditions do not closely define this period. There is minimal rotation of crops; only single plantings of taro are made and this crop covers over 90 per cent of areas under cultivation.

[433] Crops mature quickly but weed infestation and leaching result in a more rapid decline in yields under cropping than is found in highland areas. After one crop, pests and diseases become established and reduce the yields of any further immediate plantings. It is therefore essential to rely more on extending new clearings than on the intensive use of a few elaborately prepared garden areas.

The decision to cultivate a new area and the choice of a site rests with each household. Once a garden site is chosen, the secondary growth is cleared by the members of the household, using axes and bushknives. The undergrowth is cut first; trees are then felled at shoulder level and the stumps are left to provide support for yams and sugar. The branches are removed from the felled trees and the trunks are used later for fences, garden boundary marks, building materials or firewood. Undergrowth is left to dry for about a week and then burnt. Once this is done, edible pitpit (Saccharum edule) and bananas are planted at random over the cleared area. Sugar is planted near the tree stumps so that it may be tied up to prevent lodging. It is thus less susceptibe to

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[1] Conklin 1954; Lawrence 1955:5; Vicary 1960:182.

241 rodent attack. A hardwood planting stick (*ti*) is used to loosen the soil, though occasionally shovels are used to make mounds for sweet potato runners and tubers, or for yams. Sugar cane and pitpit are planted either in clumps of suckers or in lengths or 3 nodes but bananas are propagated only from suckers.

Maize, cucurbits and tobacco are planted before or with the main crop of taro. They usually grow best near stumps or logs, perhaps because they benefit from extra potash and humus.[1] Tobacco seeds are thrown near stumps and when seedlings are about 6 inches high they are transplanted throughout the garden. Numerous varieties of taro (*Colocasia spp.*), distinguished by their colour and stem and leaf shape, are propagated by suckers. The suckers are placed in holes 6-8 inches deep and spaced about 2 feet apart. A small amount of *Xanthosoma* taro is planted, usually on sloping ground, and not necessarily in the main gardens. Yams are planted in separate areas if planting material is plentiful. Otherwise they are planted at random through the garden. Two common varieties are recognized.

Sweet potato is grown only in small quantities as a supplementary diet to the taro. If it is planted among the taro, the planting is delayed until the taro is suckering. Small plots are often made in a taro garden after most of the taro has been extracted. Minor crops found in the gardens are cabbage, manioc, beans, tomatoes, ginger, shallots, pineapple and pawpaws. (Table 1.)

Gardens are usually weeded 3 times. Weed infestation becomes too heavy to handle at this stage, but crops are mature enough to compete successfully and shade from the weeds is claimed to benefit the taro.

417 [136] Fencing is not as extensive or elaborate as in many Orokaiva areas, due to a scarcity of wild pigs. Gardens are usually made on sites at a distance from the village which is considered too far for domestic pigs to wander. Despite this precaution, 2 men had their gardens spoiled by village pigs just before our visit.

Fences are raised to a height of about 4 feet by piling logs horizontally on a broad base and securing them with perpendicular stakes. In most cases the fence is erected only on the garden border which is considered most accessible to pigs. This is often done after the area has been planted. The barrier may be extended later if another side is found to need protection.

[241] [476] A virtual absence of wild pigs is partly responsible for the tendency for the gardens to be scattered. In other parts of

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[1] Cf. Vicary 1960:188.

241 [476] [417] Orokaiva territory where more effort is devoted to fence construction it is more common for the members of a village or a local patrilineal group to cultivate contiguous plots and to co-operate in the construction of one fence to protect several gardens. This reduces the total labour required for the task.

Table 1

Food plants per household*

Crop	Average	Range
Taro (Col)	0.97 acres	0.39 - 2.30 acres
Sweet potato	0.07 acres	0 - 0.20 acres
Corn	223 plants	0 - 442 plants
Bananas	71 trees	35 - 126 trees
Pitpit	88 clumps	0 - 400 clumps
Sugar	34 stools	11 - 54 stools
Yams	65 vines	0 - 136 vines
Taro (Xanthosoma)	28 plants	0 - 91 plants
Native cabbage	22 plants	0 - 100 plants
Pawpaw	17 trees	5 - 32 trees
Beans	17 plants	0 - 110 plants
Cucurbits	13 vines	9 - 28 vines
Shallots)		
Manioc)	a few plants	
Ginger)		
Tobacco	18 plants	0 - 59 plants

*12 households.

On the other hand, a total of 1 acre of taro planted in scattered plots involves more clearing than the same area planted in a continuous block of gardens. Several gardens in 1 block would have a smaller total perimeter adjoining the bush where there is usually a margin of cleared land which is never planted. The dispersal of garden sites facilitates natural reseeding of fallow land from the surrounding bush.[1]

It is difficult to arrive at an average figure for the length of the cultivation - bush fallow cycle. One particular difficulty is the fact that the clearing of a plot is often done progressively. As one section of the garden plot is cleared by a household, it is planted and then adjoining sections are cleared and planted. In some but not all cases the successive areas may then be allocated to different members in the household, such as a woman - a married sister or a brother's wife - whose husband is absent. Since few vegetables can be stored for long, this method of clearing the

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[1] Conklin 1957:145.

241 area over many months ensures a continuous supply of maturing food over a long period, but it means that one section may have been abandoned some time before the plot as a whole is finished. Therefore, there are limitations to estimates of the rotation period, made by determining the number of years which have elapsed since the previous clearing of the plot.

An average of 6 years had lapsed since the land under cultivation was said to have been last used. One area had not been cultivated for 15 years but in several cases the land had been fallow for only 4 years.[1] Informants stated that this rotation period was long enough to maintain yields. By that time secondary growth (enda) of a reasonable height[2] has become established on the overgrown garden (manene).

Many areas of enda had been unused for longer than this average fallow period. These included some parcels of land held by the patrilineal group which has the least land per capita among our sample (see p.58), but the blocks which have been fallow for at least 20 years belong to the groups with large landholdings. Some of these areas were considered less suitable either because the soil is of a slightly poorer type or because they are not a convenient distance from the village.

The short cultivation - bush fallow rotation does not occur repetitively even on a fixed number of selected parcels held by the members of the sample. Since the average period of bush fallow was deduced from the dates of the previous use of the total area at present under cultivation, it must be noted that 49 per cent of this was on land belonging to a group other than the planter's (see p.70 ff.). The shortest fallow period was no more [423] common among the gardens of men with small landholdings than among gardens of those with large areas. Some gardeners from each group were exercising usufructuary rights as cognatic kinsmen of landholders of other patrilineal groups (see Table 5).[A] Those who were cultivating a total of 6 acres of land of members of other clans generally claimed that permission to use this land was granted on a reciprocal basis.

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[1] Williams' informants at Wasida said that land was replanted after 4 years' fallow (Williams W .27).

[2] The Orokaiva generally maintain that it is easier to clear areas where fairly large trees are standing than areas with no prominent timber. See also Newton (1960:113) who points out that within 5 years of the start of a tropical rainforest fallow 'the total quantity of nutrients immobilised is more than half the total immobilised in an eighteen-year-old forest fallow'.

A. [See Category 423, p. 70--Analyst]

241 About 2 acres of land held by the sample were being used for food gardens by members of other clans. If we assume that the parties periodically exercising reciprocal usufructuary rights to each others' land eventually use comparable areas, the number of acres of a patrilineal group's land cultivated over several years will be roughly equivalent to the total area which it has itself cultivated.

(126) Chain and compass surveys were made of all current gardens cultivated by the sample. These gardens ranged from plots overgrown with weeds, but still yielding taro or sweet potato, to newly cleared areas. Measurements of the areas which were cleared during the last 2 weeks of our survey were made hurriedly and are
311 less accurate than the other figures. The time spent clearing new areas in each of these 2 weeks was more than the total time spent
241 on gardening recorded in any previous week and the figures below at least give a fair indication of the significant size of new clearings in relation to other categories of the area under cultivation shown in Table 2. The lack of rain at the time made it impossible to plant any of the new areas immediately.

Table 2

Current garden areas
(acres)

	Area per head of population	Area per able-bodied person (over 16)	Area per household	Total
Garden currently producing	0.14	0.27	0.57	6.86
Garden planted not yet producing	0.12	0.23	0.48	5.81
Garden cleared not yet planted	0.10	0.20	0.43	5.17
Total area under cultivation	0.36	0.70	1.48	17.84

The 0.36 acres of current garden per head of population compares with the figure of 0.31 at Inonda (Crocombe and Hogbin 1963:10).

The proportion of currently-producing gardens seems to have been unusually small at the time of our survey. Sixty-one per cent of the garden area had been brought under cultivation in the past 5 months (2.2 acres per month), whereas the rest was all that was still producing after cultivation during the year before that. Some households had planted, harvested and abandoned some plots in the meantime. Most of the gardens which were being harvested during our stay had been planted within the previous 6 months and those which had been planted longer were generally well over a year old and were entering the closing phases of production.

One householder whose older garden had been destroyed by pigs had first cleared his present gardens only 5 months before our survey. Some of the older current gardens measured were almost exhausted and would only just last until the taro in the householders' new gardens matured. The supply of food from the old gardens in these cases was supplemented mainly by the newly-sown corn which matures in about 3 months, by tree crops, yams and Xanthosoma taro from small scattered stands.

In deciding on the time to establish new gardens for their future subsistence needs the villagers seem to have taken into consideration the prevailing seasonal conditions and the prospects of heavier rains a few months before our survey so that we noted only a few gardens that were made in the year before our arrival and already producing.

By determining the area which has been cultivated by each household since it made the first clearings for its current gardens a monthly rate at which it established gardens was calculated. The total area gardened monthly by the 12 households together was found to be 1.53 acres. The sample therefore cultivates 18.36 acres per year or 0.36 acres per capita.[1]

For the above reasons we believe that we would have obtained more reliable figures had we been able to extend the length of the survey to cover fluctuations in the rate of cultivation and in the ratio of new to old gardens. The figure of 0.36 acres as the yearly per capita requirement for garden land may be unusually high: however, the Survey of Indigenous Agriculture at Sivepe estimated that between April 1961 and March 1962, 53.76 acres had been brought under cultivation by the 159 people in the village, or 0.34 acres per capita. The mission from the International Bank gives the average per capita requirement as about 0.3 acres under this class of land use in Papua and New Guinea.[2]

If an average 6 year fallow cycle is followed, the present population of the sample cultivating land at the rate of 18.36 acres per year require 110 acres to maintain their present

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[1] The 4 households who had no current gardens older than 10 months had made these new gardens at the annual per capita rate of 0.51 acres compared with 0.29 for the rest of the sample who were still using earlier gardens.

[2] Mission from the International Bank 1964:74.

241 311 standards of subsistence agriculture.[1] Their own property totals 138 acres.

c. Hunting and fishing

224 [136] These pursuits add variety ot the diet but provide comparatively little food. Most of the game surviving in the area is small and there are no large fish to be found in the mountain streams. Small marsupials such as the cuscus, bandicoot and, more rarely, the land wallaby, together with flying foxes and birds are the main sources of animal protein. Nets and hunting spears are generally used to catch these animals after they have been flushed out by the hunter's dog. Traps are seldom set for game but we were told this formerly was a more common technique. Snares for the smaller types of animal are often made by boys and one or two of the men. Two members of the sample owned licensed shotguns and these were very effectively and economically used. One of these men would place his services at the disposal of anyone who supplied cartridges for the gun; the other allowed a limited circle of people to use his gun. The guns were frequently used for hunting at night in the dry weather during our survey.

226 Neither of the two forms of concerted hunting common among other Orokaiva (the drive towards a pig net and grassburning, Williams 1930:45) is practised to any extent as there are few wild pigs and little grassland in the area.

Spears and fine-mesh nets are used in local streams to catch eels and the 7 types of small fish found. This task is shared by men and women usually when the water is low during a period of dry weather. They may search for fish with a net along the Sohu River wherever it passes through land held by a member of the village, but the small rock dams built by a man to form pools suitable for the use of the spear are made only where the river passes through his own land.

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[1] This requirement is 2.2 acres per capita. Barrau (1958:75) says that 2.5 to 5 acres per capita are sufficient for this type of agriculture in Melanesia, assuming the average area of garden is 0.25 acres and that the duration of bush fallow ranges from 10 to 20 years. In March 1951, 40 square miles of unrestricted land were considered suitable for resettling 4,500 of the survivors of the recent eruption (Plant 1951:4; Belshaw 1951:9). It was felt that these 5 acres per capita were enough only to meet the immediate requirements of traditional subsistence gardening for the next few years. (It was well-wooded and appeared 'most productive' and easily accessible by road.) Considerable population increases were anticipated.

423 [224] [226] The only local hunting land held by Sivepe people is that held by individuals as gardening land. A villager may hunt or fish on the land held by members of any group in the village and in fact often strays further afield than this 'village land' without attracting the attention of other groups. A man may, without consulting others, invite a kinsman from another village to hunt or join in a fish drive with him but no hunting parties involve the assembly or co-operation of larger groups. A man wishing to hunt on the land of one of his kinsmen in another village would consult his kinsman first.

d. Livestock

235 [231] Apart from the game available to the hunter, there are only 2 sources of fresh meat available, the domestic pig and fowl. Six householders own a total of 15 fowls which were either bred or bought by their owner. They are valued mainly as an asset for times of feasting and only to a limited extent for egg production. They are allowed to run loose in the village during the day but are enclosed in shelters at night for protection against dogs.

231 [241] Like fowls, pigs are fed by women mainly on scraps but they find much of their food by roaming in the bush and grazing in old gardens. They have complete freedom of movement within or outside the village during the day and in some instances only are they housed in pens during the night. As a result, they are a constant threat to gardens which are not thoroughly fenced; their movements are a frequent source of dispute and require the gardener to exercise care in siting his garden and sometimes to devote considerable time waiting there to attack a pig which has been frequenting the area.

[431] [426] Of the 24 pigs or piglets claimed by 7 of the 12 householders, 15 were bred by them and the rest received in gift exchanges; none was inherited. The only longstanding debts admitted or claimed by members of the sample were in terms of pigs.

[146] There is little animal protein in the villagers' diet; some fresh meat and smoked meat or fish is purchased at Saiho market or from vendors travelling to the market - this source of meat seems to be quickly becoming reasonably accessible (E. Waddell: personal communication), but wild pigs - a very important source in many other Orokaiva areas - are rare and the area for hunting restricted. It would be feasible to take steps to modify any lack of animal protein by increasing stock numbers and improving their quality, but this would involve the introduction of new strains and, to maintain any increase or improvements, husbandry techniques would need to be refined.[1] At present parasites take

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[657] [1] About 50 Berkshire boars were distributed to Village Constables among the groups affected by the Mt Lamington eruption.

423 [614] clansmen or other kin of members of the group. But this takes the form of a request to these kin to attend and to bring the food with them and the group could never demand access to the resources of others.

Table 3

Rights to economic trees

	No. of trees	% of total
Planted by rightholder or his father on their own land	463	62
Planted by rightholder (or others) on land of another clansman in Sivepe or elsewhere	55	7
Planted by rightholder on land of matrilateral kin	22	3
Planted by others on land of his matrilateral kin	31	4
Planted by rightholder on land of affines	43	6
Planted by rightholder (or others) on land of cognatic kin of another clan	14	2
Planted within village sites	120	16
	748	100

●241 f. Equipment

The hardwood dibbling stick, ti, is still used universally for planting taro. Other tubers are sometimes planted in mounds made with a shovel but all of the 4 shovels used by members of the sample had been found (at World War II Army dumps) or had been given to the owner. Every householder owned at least 1 bushknife for use in clearing, weeding and harvesting; all had 1 axe or sometimes 2, and at least 1 grass knife. A few of these tools had been received as gifts. Two householders had picks and 2 others had both hammer and saw, while 2 men had only a saw.

435 Total current replacement value of all these tools, including those found or received as gifts, is £50.6.0d.

The 2 shotguns owned by 2 men would cost roughly £30 each (apart from licences).

g. Labour

461 125 We conducted a pilot survey of the patterns of work among members of our sample for 6 weeks.[1] Approximate times were

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[1] From 10.12.62 to 20.1.63 a similar survey was carried out at Inonda (Crocombe and Hogbin 1963:61) and fuller studies by P. Krinks and E. Waddell are now being prepared for publication.

428 before establishing a household. The older brother should in time
provide the other with an equitable share of the land.

There is no system of primogeniture in theory or practice.[1] In
one case, however, a childless man, who was adopted into the local
branch of Jegase clan and has also married a Jegase woman, either
has bequeathed his land to the leader of his wife's lineage who
allocated it to his second son, or he has himself bequeathed it
specifically to the boy (who was given his wife's deceased
brother's name). Most of the patrimonial land and some land held
by the woman are to be inherited by the elder son.

241 Turning to the extent of landholding, the 12 households studied
hold 138 acres near Sivepe or 2.7 acres per head, all of it arable
with the exception of little more than 1 or 2 per cent.[2] Some
members claim to retain land in relatively distant areas where
they or their forefathers originally lived. In cases where the
Sivepe people had not exercised their rights to cultivate these
land claims, no estimate of their size was made.

b. The history of local settlement

177 The territory of the mountain Orokaiva was opened up when a new
road from Buna to the Yodda Valley goldfields near Kokoda was built
in 1904. In this part of Orokaiva country individual tribes were
not as isolated as elsewhere. Although the various tribes were
initially described as being constantly warring, and likely to
[721] attack government parties,[3] peace was secure within 4 years.
Intertribal feuds were effectively suppressed, except for an
occasional raid prompted by the docility of neighbouring tribes
under the novel conditions brought about by the arrival of the
[166] Europeans. Many tribes, including the 'Wasida', were able to
settle on their outlying lands which formerly they had not
occupied for fear of raids.

[464] Many of the people worked on the construction of the road, and
later as carriers; by 1909 some had signed on for labour elsewhere

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[184] [1] In this way, the mountain Orokaiva differ from at least one other
Orokaiva tribe, the Yega at Beporo (R. Dakeyne: personal communication).

[162] [2] This density is the equivalent of 237 persons per square mile
(cf. 300-500 per square mile for Southern Chimbu, Brown and
Brookfield 1959:74). The Saiho Census Division, on the other
hand, has only about 75 persons per square mile; however, as Map 2
indicates, it includes extensive areas of unoccupied and generally
unused rainforest surrounding the concentration of populations with
higher densities and separating them from their former enemies.
Some of the land of the thousands of Kombu Sangara killed in 1951
also appears to fall inside the Saiho boundaries.

[3] See Territory of Papua 1903-4:39; ibid. 1904-5:14, 36.

[TEXT CONTINUED ON PAGE 41]

613 Overall the land of Berekipa lineage is more fragmented, though less scattered than the holdings of the Bebehupa, which are larger.

From detailed accounts of completed land transfers between the Berekipa and Arehu, whose present holdings are mostly interspersed[1] near the sites of Simbehata and Pusahambo, and from other historical data we infer that this land previously formed far more continuous tracts belonging to descent groups such as these. To a noticeable extent the spatial relations between the shares of the Bebehupa, Berekipa and Arehu in the extended tract of Jegase land marked by the sites of former settlement can be construed as a teritorial correlate of the pattern of each lineage's ancestors' migrations to or from local groups there. The shifts of residence relevant today are remembered in some detail.

e. Land use and mobility

● 241 Williams (1928:156) advocated a change from shifting to sedentary agriculture for the Orokaiva on the grounds that the former was wasteful of land and labour, and that the tendency to form small independent settlements resulted from the 'lax method of horticulture which necessitates the clearing of many areas in succession and sometimes a temporary settlement on a distant site'. He considered shifting agriculture to be 'one of the most potent causes of village and clan disintegration'.

[361] Keesing (1951:8) noted that the mountain Orokaiva had generally resisted the post-war movement to consolidate into larger villages. So long as the 'mobile economic base' persisted, he considered that resettlement into larger permanent villages after the Mt Lamington eruption would be unlikely to succeed. The Orokaiva showed no inclination to adopt more intensive sedentary cultivation and he predicted that a return to shifting agriculture would involve 'seasonal movement' outward from the environs of the settlements to new cultivation areas, and later the resumption of settlement in scattered hamlets. In view of these assertions about the connection between agricultural practice and settlement patterns, upon which Williams and Keesing based their discussion of economic development, it may be useful to examine the relations in Sivepe between mobility and village stability on the one hand, and traditional land use on the other.

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[361]
[721] Keesing suggests that the tendency, mentioned by Williams, for the Orokaiva to disperse into smaller residential units since pacification had been particularly marked on these heavily populated slopes. The suppression of intertribal feuding probably

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[1] To a lesser extent they are also interspersed with parcels of other lineages' land.

621 At the time of resettlement these writers drew attention to the possibility that the composite villages would eventually be disrupted either by aggravated friction between members of different clans who had not lived together before or by the unsuitable siting of the settlements with regard to access to the villagers' own gardening lands.

[754 [166 The first problem was solved by individual mobility. Our own experience which is confirmed by the observations of patrol staff is that fear of sorcery, which follows tension within the village, is one important example of the vicissitudes of social relationships which are responsible for much of the movement from one village to another at present.[1] But the problem of the location of gardens in relation to residence was solved in time wherever people moved from the main road or other temporary settlement areas to new sites on or near their old land.

This land use problem was peculiar to the exceptional resettlement conditions and Keesing seems not to have considered this point when he concluded that the formation of larger villages was incompatible with the economic base of shifting agriculture. His prediction that people would continually 'hive off' into hamlets of a dozen houses consistent with their familiar system of seasonal shifting gardens does not seem to have eventuated.

[166] L The scattering of an individual's land interests over a neighbourhood facilitates mobility between adjacent villages because after moving, for whatever reason, he can often continue to exploit rights to those lands which are at a convenient distance from his new village. We found, however, no evidence to suggest that shifts of residence are determined by a continual need to clear new areas for cultivation even if these areas lie scattered near a number of villages.

171 241 361 Residential mobility is not as closely correlated with changes in gardening sites as it is among the Chimbu even though, as Williams says, the Orokaiva move their garden sites frequently. Among the Chimbu, on the other hand, where a long cultivation period usually of at least 4 years, sometimes broken by short fallow periods (when the area of cultivation within the plot is shifted), is followed by long fallow periods of varying length up to about 20 years (Brookfield and Brown 1963:52), 'the principal factor determining residence is land; most men prefer to live near their main blocks of currently cultivated land' (ibid:97).

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[1] Other examples are disputes between kin, and life-crises. About 1956 the oldest Bebehupa man left Binduta to spend his last years at Nahihita, an area to which he has been emotionally attached for much of his life. One or 2 close kin went to look after him and a series of other Bebehupa have followed.

241 171 361 With the passage of the cultivation cycle over a Chimbu subclan's territory, gardeners move from one men's house to another, either as a persisting group of agnates working contiguous holdings, or as individuals joining more transient groups which are dissolved as gardens near the house revert to fallow (ibid:98; Brown and Brookfield 1959:68). As they extended their cultivation to other areas, 37 per cent of a sample of 193 men had moved from one men's house to another over a period of 16 months (Brookfield and Brown 1963:98) and the men's houses themselves last no longer than 5 years (ibid:12).

241 In Sivepe on the other hand, gardens tend to be scattered and isolated. Father and son often have adjacent plots in one garden area but the son usually has at least 1 other garden elsewhere. A young married man often has 1 garden on the land of his wife's father, whom he will periodically assist in his garden. Older men in general adopt the technique of progressively planting and clearing a single large area while younger and more active men, usually with more obligations to affines, tend to cultivate several scattered smaller plots.

[621] [602] There is no local group or extended kinship group which commonly combines to make a block of contiguous gardens. Even when all members of the village plant simultaneously for a special feast, the gardens are not adjacent. A man usually takes advantage of the choice of exercising planting rights on the land of a wide range of kinsmen (not necessarily his agnates), both those within the village and to a lesser extent kinsmen from other villages. Several had current gardens on their mother's brother's land, some on the nearby land of their wife's brother, sister's husband or daughter's husband.

613 614 184 In other Orokaiva areas (such as Inonda) gardeners of one lineage often have a reciprocal arrangement with another lineage of the same clan in the village to cultivate a parcel of their land with them, but this is not a common practice at Sivepe. In the few cases where several kinsmen have made adjacent gardens the gardeners are mostly cognatic kin from different clans or villages and each will probably make his next garden with different kin or on an isolated parcel.

166 171 425 Encroachment on boundaries is feared[1] but does not seem to result in repeated changes of residence as it does among the

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[578] [1] The 3 instances of boundary disputes recorded were between Bebehupa and Usohu people. According to the older men the Usohu were formerly a Jegase group and they share many boundaries with the Bebehupa; the recent split in Binduta between the 2 groups has been accompanied by friction over a number of issues including the definition of boundaries.

Chapter 5

The land and economic development

433 e. Shifting cultivation and residential stability

Under the present system of horticulture the amount of land surplus to current subsistence needs is small and imposes limits to expansion of commercial agriculture.

Williams (1928:154) regards the system of subsistence cultivation as wasteful because it requires such a large area per person. However, the practice of shifting gardens frequently and for short periods on scattered plots does give maximum yields and maintains soil fertility. Brookfield and Brown (1963:166) point out that no successful alternative to land rotation has yet been proven for subsistence agriculture in the tropics. Population pressure and soil fertility are not sufficiently serious problems on the slopes of Mt Lamington to warrant the measures which Fisk (1962) recommends in other circumstances.

[361] Keesing (see Chapter 3, Section e) argued that the rotation of land adversely affected social stability. But the settlement pattern which developed after the emergency shows that there is no necessary connection between dispersed settlement and either the local population density or the method of bush fallow rotation. Some very large villages formed after the eruption (e.g., Soroputa and Kiorota) retained large groups of immigrants who owned no [166] gardening lands near at hand. The present high rate of mobility between other villages, most of which are much larger than before, is not closely correlated with the shifting of garden sites. Among the Chimbu, by contrast, land use is more intensive, but frequent shifts of residence between scattered hamlets are related mainly to gardening needs.

178 361 166 241 With the introduction of cash cropping the Chimbu pattern of settlement is becoming more permanent (Brookfield and Brown 1963:98). There is little significant evidence either to support or oppose our belief that the planting of individual coffee plots since the mid-1950s has not been associated with a drop in

178 361 166 241 individual mobility among the mountain Orokaiva. We especially doubt the generalization that the introduction of tree crops induces the fragmentation of villages into small 'bush settlements' which many observers thought would be established on the site of the gardens. When Agriculture staff first advocated individual cash-cropping among the Orokaiva, the policy was opposed by mission staff who feared that the villages would disintegrate as each grower moved to live near his coffee garden.

This has not in fact eventuated although there has been some movement from large temporary post-eruption settlements like the Isivita villages when immigrants returned to their own land to plant coffee or cocoa.

425 b. Developments related to land tenure

Disparities between the areas in which individuals and groups held proprietary rights are overcome by individuals acquiring rights to other land through interpersonal relationships. Cash cropping by individuals does not seem to have reduced the flexibility of exchanges and transmission of land rights. Three of the 5 persons who planted coffee on land held by members of our sample are not members of the group holding proprietary rights. Similarly, of 28 people who applied to the local government council for registered areas of cash crop land on 7 blocks held by the sample, 8 were not members of the rightholding group.[1]

[654] The need for such transfers is increased by requests from extension officers and the council to locate coffee gardens contiguously to facilitate pest control, extension services and surveying.

[241] [178] [177] Norton (1962:12) argues that new practices in the transmission of land rights have emerged with the expansion of coffee growing since 1956. Our evidence, however, shows that the significant change has been rather the introduction of a new method of cash cropping. The only experience the Orokaiva had of commercial agriculture previously was of large-scale production on plantations owned or directed by Europeans. They had not entertained the possibility of production on an individual basis.[2]

423 614 Norton expresses a view widely held among government officers[3] that the introduction of perennial crops is seen by members of the

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[1] Four of the other 20 applications were made on behalf of members absent in employment and 2 on behalf of boys.

[2] See Crocombe 1964:30.

[3] See Minutes of Higaturu Native Local Government Council Meetings.

(b) Climate

132 [241] According to Köppen's climatic classification (Köppen and Geiger 1930) the whole area falls within the Af category (humid tropical lowland), the uniformly high temperatures and rainfall providing a long growing season calculated by the CSIRO to be effectively twelve months in 9 years out of 10.

[821] Two seasons, commonly referred to as 'wet' and 'dry', are definable in terms of wind direction, rainfall and humidity and are clearly recognised by the Orokaiva. The 'wet' season, from December to March, is characterised by north-easterly or north-westerly winds, high temperatures and humidities and late afternoon thunderstorms, while the 'dry' season, from May to October, experiences north-easterly winds, lower temperatures (particularly at night),[1] less cloud cover and more irregular rainfall, both in frequency and intensity.

The mean annual rainfall almost everywhere exceeds 100 inches, increasing inland to 157.6 inches at Awala on the lower slopes of Mt Lamington. The wettest and driest months are December and July respectively, the precipitation ratio between the two being in the range of 5:1 or 5:2. The rainfall pattern is not strongly seasonal by Papua-New Guinea standards and the element of seasonality decreases from the coast inland, from a coefficient of seasonal variation of 0.34 at Buna to 0.27 at Awala. Further, the deviations from the mean reveal that there is only a moderate variability of rainfall; nevertheless it (as revealed in Table 1:1) has considerable bearing on the rhythm of agricultural activities and economic life in general. 241 While the pattern of food production clearly varies with the two dominant seasons,[2] the time-consuming tasks of clearing bush and establishing new gardens show no definite pattern other than a close association with the occurrence of dry periods. Thus the availability of labour and its application demand some flexibility to accord with the vagaries of weather.

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[1] Mean maximum temperatures over the year are in the range of 83° to 88°F., relative humidity at 9 a.m. is 80 per cent falling to 72 per cent at 3 p.m., and mean minimum temperatures are from 65° to 70°F. These figures are derived from observations made at Sivepe on the lower slopes of Mt Lamington. Temperatures can be assumed to be 5°F. higher at the coast and the diurnal range slightly less.

[2] Distinguished by the Orokaiva as garepa - the wet season - when the staple taro (Colocasia) is in production, and huvira - the dry season - when the people must resort to sago, breadfruit and less favoured foods. [821] [262]

591 [614] may be influenced by proximity to a new area of land it is intended
[166] to bring into cultivation.[1]

423 (iv) Rights to land. The Orokaiva social system is characterised
by flexibility in arrangements for group membership and for
[428] transmission of rights to land (e.g. through adoption). Inheritance
is usually patrilineal[2] and various land rights may be distributed
at a number of levels of social segmentation - the clan branch,
lineage and individual - the relative significance of each varying
with locality and, apparently, population density.[3] Further, more
614 than one descent group may have rights in a single piece of land.
423 In many instances the clan branch functions essentially as a reference
group, all land being associated with it. However, it may
function as a primary right-holding group for those hunting areas
distinct from current garden land, typically the grasslands.[4]
Priority rights to garden land are normally vested in the lineage;
nevertheless, all such land is ultimately identifiable with individuals
who may distribute land (and property) prior to their death
not only to their immediate family but also to more distant kin.[5]

● 244 This markedly influences the pattern of both exploitation of
423 land and transmission of rights. In the low density areas a number
[613] of descent groups often agree to exploit simultaneously an area

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[754] [578] [1] Rimoldi (1966:68) found no evidence of the need for new land as a motive for movement. He considers the major motives to be fear of sorcery, disputes between kin and life-crises. It is nevertheless conceivable that the fear or sorcery or disputes might arise from poor yields from over-cropped garden land, which would require a move in any case.

[562] [2] Women are known to hold land only as a form of trust for their children (Crocombe and Hogbin 1963:75).

[311] [614] [3] We do not know whether any causal relationship exists between these two factors. However, the existence in low density areas of primary forest surplus to current garden needs, plus extensive grassland and mountain areas utilised largely in hunting only, might well account for the responsibility for such land being vested in the larger social group, the clan branch. This group's significance has been eroded in the high density areas, where there is little or no land surplus to present gardening needs.

[224] [4] In the high density areas hunting is frequently confined to garden land and individuals can commonly hunt over land belonging to anyone in the village.

[5] For example, sisters' sons (Crocombe and Hogbin 1963:24).

● 241 423 [613] [425] [578] that is then cultivated contiguously,[1] while in the high density areas there is a tendency towards a more individual pattern of exploitation.[2] Short-term rights to land for the non-lineage members are frequently granted (on a reciprocal basis), sometimes to facilitate contiguous cultivation or to compensate for inadequate landholdings. This pattern is promoted by the high degree of fragmentation of individual holdings. Further to this, Rimoldi (1966:62, 95) observes that plots are often permanently transferred outside the direct patrilineal line, and this applies equally to land under both cash and subsistence crops. In the Inonda area, however, Crocombe and Hogbin (1963:73-5) observe that there is considerable reluctance to plant, or make land available for planting cash crops if the land has not been acquired patrilineally, for fear of subsequent disputes. Thus the tenurial situation may be of considerable significance in the development of cash cropping.

245 428 Traditional tree crops are not planted in stands or groups like cash crop trees, but are widely scattered and may equally well be planted on patrimonial land or on land of affines or matrilateral kin. Inheritance of rights to trees usually does not involve rights to the land on which they stand. However, owing to their wide spacing, their presence rarely seriously affects other cultivation of the land.

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[1] The decision-making process has not been investigated but it appears that there is no institutionalised position relating to land matters. An exception is provided by the Yega of the Gona census division who recognise a 'land custodian' (see Dakeyne 1965:55).

[311] [136] [417] [2] It is possible that this is an expression of the fact that sufficiently large areas of suitable secondary forest are not available at any one time to permit contiguous cultivation. Two other factors are that in low density areas wild pigs and other animals necessitate the fencing of gardens, a task which is easier for contiguous groups than for individuals, and that in forest much wider fringe clearing is necessary than in low second growth. The volume of fringe clearing per garden is much reduced if gardens are contiguous.

794 not necessarily leaders in the old authority structure but often
people with particular experience of white rule (e.g., policemen).[1]
177 Both cults were suppressed by the Administration although the Taro
178 cult persisted until 1928 and possibly reappeared in the Gona-Buna
area in 1941 (Worsley 1957:124), concurrent with rumours of imminent
Japanese landings.

178 The ending of inter-tribal skirmishing, which directly affected
the social roles of the sexes, also extended the physical range of
657 interactions open to individuals and resulted in the proliferation
of hamlet groups, comprising single clan-branches, i.e. a fragmenta-
361 tion of the main villages. Administrative efforts in this period
[721] were directed towards countering this latter process and concentrat-
ing settlements along the roads to facilitate supervision, encouraging
improved building styles (particularly the erection of houses on
stilts above the ground) and establishing more ordered 'line'
villages built around a central square.

(b) Commencement of cash cropping

● 241 From its beginnings the mainstay of government policy was the
[657] encouragement of indigenous cash cropping. Regulations introduced
in 1894 and 1903 provided for compulsory plantings of economic
trees, particularly coconuts, rubber and citrus, but few were ex-
ploited commercially. Under the Native Plantations Ordinance 1918
and the Native Plantations Ordinances 1925-52, twenty-six community
plantations were established in the Orokaiva area with both govern-
ment and villagers participating.[2] Cocos, coffee, oil palm, cotton,
tobacco and rice were all tried; however, owing to a fall in prices,
[466] all but coffee were abandoned. According to Crocombe (1964:16),
there was no enthusiasm among the people for the scheme as they
[434] considered the cash returns inadequate: each man was required to
work sixty full days per year and returns varied from less than $1
to $8 per year, which was well below the returns from working on
European plantations at that time. Some 10,000 trees, predominantly
coconut, were planted in 1914-15 in the Orokaiva area and by 1921
it was estimated that there were 46,404 coconut trees in the Northern
[433] Division and some 7,000 rubber trees (mostly in the Awala area).
The planting of coffee commenced in 1923 and by 1936 there were

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[1] Such a development may well also have been characterised by the building up of more extensive group solidarities. Burridge (1960:25) does suggest, however, that the Taro cult may have been a particular expression of a similar type of cult occurring in the pre-contact era.

[2] Proceeds deriving from the sale of the crops were shared on a 50-50 basis. For a detailed treatment of these communal plantings see Crocombe 1964.

241 242 acres[1] which yielded 84 tons of hulled coffee in 1938-39. Some
[433] 1,000 cocoa trees were also planted in the pre-war period, although
only the copra and coffee were worked during this time. All com-
[177] mercial agriculture ceased with the Japanese invasion in the second
world war and was again interrupted by the eruption of Mt Lamington
[731] in 1951. The principle of compulsion was withdrawn in the same year
and community enterprise largely ceased in the mid 1950s with an
[466] increasing trend towards individual plantings. The whole scheme
was characterised not only by low returns to labour, delays in payment,[2] frequent disputed claims to plantings and serious problems in work organisation, but also by a definite feeling of resentment on the part of the indigenous participants.

(c) War and natural disaster

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[731] The Orokaiva view of the government was no doubt influenced by the second world war, which led to the Japanese occupation of the Northern District from July 1942 to January 1943, and by the eruption of Mt Lamington in January 1951, causing the death of over 4,000 people and the destruction of the district headquarters and staff at Higaturu.

657 The impact of the Japanese invasion and subsequent Allied re-
advance has never been assessed but must be considered profound.
All Australian administration ceased and, when resumed, was vested
in the Australian New Guinea Administrative Unit (ANGAU), a military
[466] authority. Several thousand men co-opted as carriers by both
Australians and Japanese worked under very arduous conditions.[3]
Since the Orokaiva lay athwart the main Buna-Kokoda route which was
the scene of fierce fighting, many villagers retreated into the
surrounding hills where they were obliged to subsist on very
[687] limited resources because of the absence of much of the potential
labour force.[4] Others sided with the Japanese or profited by the
[541] power vacuum to attack or betray Allied troops and civilians or to
assert their authority over other Orokaiva. On resumption of
Australian rule, twenty-two men were sentenced for such deeds by a
military tribunal and publicly hanged at Sangara and Higaturu.[5]

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[1] An estimated 111,000 trees at a spacing of 10 by 10 feet.

[2] As much as three years lapsing between delivery and payment (see DDA, DS-17-4-5).

[3] For details of terms for the conscription and of conditions, see McCarthy 1959:116, 132.

[165] [4] A 1948 report refers to a rapidly decreasing population on the northern slopes of Mt Lamington and attributes it in part to the war when many died from malnutrition while hiding in the bush (Higaturu 29-8-33).

[5] A European informant stated that 'several thousand Orokaiva' witnessed the execution, the women 'wailing and mutilating themselves'.

797 The majority of Papuan teachers remain unqualified teacher-evangelists although the mission is largely responsible for education in the sub-district at the primary, secondary and technical levels. A significant feature of their education programme as a whole remains its total disregard for agricultural training, except incidentally at the Martyrs' Memorial Secondary School where the pupils maintain a coffee garden as well as their own food gardens.[1]

[743] [657] Medical work has already formed a large part of the mission's activities and most mission stations operate a clinic and small hospital while a T.B. hospital is maintained at Embi. As with education, these activities are largely standardised by the Administration and the Department of Public Health is gradually taking over from the mission in this field.

(e) Recent developments in commercial agriculture

● 241 In 1941 a European planter obtained an agreement, under the Transactions with Natives Ordinance 1893-1935, to exploit the communal rubber plantations in the Awala area.[2] These had not previously been worked. Production commenced in 1943 and continues to date, interrupted only by the Mt Lamington eruption. However, the number of plantations incorporated in the scheme fell steadily and by 1965 only about 30 stands were being worked and tapping had become irregular. This is due partly to poor communications, partly to the fact that an agreement satisfactory to all parties was never arrived at and partly to the planter's own trees coming into full production.[3]

[245] The re-opening of Popondetta agricultural station in 1954 led to a renewal of interest in cash cropping with, in particular, the extensive planting of cocoa. By 1964 there were estimated to be 491,000 indigenous-owned coffee trees in the sub-district, 244,000 cocoa trees, 25,700 rubber trees (almost entirely the product of natural increase) and 108,000 coconut trees. This pattern of steadily increasing plantings only levelled off temporarily in 1959-60 with falling coffee prices, a shortage of coffee seed and inadequate marketing arrangements for cocoa. At the time labour

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[1] However, agricultural training at several levels has been available since 1955 at DASF's Popondetta Agricultural Station (now Popondetta Agricultural Training Institute).

[2] These had been established during the first world war in that part of the District considered too far inland for worthwhile copra production. There were 137 stands in all.

[3] For a detailed description see Rimoldi 1966:86-93.

241 was also diverted to the plantations being established in the Sangara area under the Ex-Servicemen's Credit Scheme.[1]

The increased rate of development after the war, a re-orientation
in policy towards individual rather than communal holdings, the
allocation of the majority of settlement blocks under the ex-
servicemen's scheme to Papuans and New Guineans, and the establishment
of the Higaturu Local Government Council in 1956 and the Oro Bay
443 Council in 1963 have probably all served to transmit to the Orokaiva
a sense of participation in the development process. At the same
time, incentives for the acquisition of cash have grown with the
proliferation of trade stores (including over twenty owned by
Orokaiva men) and the establishment of companies seeking local
share capital, while interest in the sale of produce has increased
with improvement in communications and with immediate cash payments
for such sales.

241 An important factor in the growth of interest in cash cropping
657 has been the implementation of a variety of land tenure and market-
ing schemes, directed entirely towards the indigenous producers and
[425] in part initiated by them. Since 1957 the Higaturu council has
been encouraging the registration of individual cash crop holdings,[2]
the Yega people at Gona have begun subdividing clan land into
permanent holdings, while similar developments within the context
of the Land (Tenure Conversion) Ordinance 1963 have already been
474 initiated.[3] There are now ten co-operatives operating in the sub-
district, predominantly along the coast; most are concerned
primarily with marketing copra and providing retail stores, but
this also includes the Orokaiva Coffee Growers' Society (OCGS),
which was established in 1962 to operate a factory previously
erected by the Higaturu Local Government Council and to purchase
coffee from the growers.[4] By the end of 1964 subscriptions by
villagers amounted to $7,010, held in $10 shares, 65 per cent of
this total having been raised in the first six months of operation.
The society paid its first dividend of 5 per cent in November 1964.

454 In 1963 an expatriate planter established a local trading company, Oro Ltd, comprising three Papuans on its board of six directors and seeking local share capital in minimum holdings of $5. Again

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[1] See Howlett 1965, for a detailed description.

[2] See Crocombe and Hogbin 1963:89-93.

[3] Each with varying degrees of success. The Higaturu scheme, for instance, fell into abeyance in 1964 due to a shortage of staff capable of surveying the holdings for which registration had been requested, as well as its doubtful legal validity.

[4] See Crocombe and Hogbin 1963:94-6.

454 considerable interest was shown, more than $14,000 being subscribed by the Orokaiva in the first six months of operation. However, it appeared during 1964 that this company might experience the same pattern of high initial interest and subsequent disenchantment, accentuated by the failure to pay a dividend at the end of the first year of operation.

439 Cocoa is purchased by both DASF and the Popondetta Cocoa Fermentary Ltd, a company financed entirely by European capital. Plans were being made in 1964 for the ex-servicemen settlers, both indigenous and expatriate, to establish their own fermentary.

366 [438] Weekly markets at Popondetta and Saiho provide outlets for subsistence produce but turnover is small and it is doubtful whether they contribute significantly to many individual incomes.[1] The principal buyer at Saiho is the Public Health Department and at Popondetta, the urban indigenous wage labour force, but in both markets the volume of transactions between subsistence-oriented villagers (primarily involving lime, smoked fish, areca nuts and fresh meat) is increasing.

435 461 [433] The Administration and the Anglican mission buy fresh foods brought to their stations. Since purchase prices were fixed by the Administration at 2c and the mission at 1c per lb,[2] and only a limited quantity is required, there is little incentive for the villager to increase production.

[241] In spite of an increasing commitment to cash cropping, rates of planting and levels of production fluctuate with changing prices and difficulties in selling certain crops. The purchase price for coffee has ranged between 9c and 32c per lb over the period 1955-65 while that for latex has fallen from a peak of 55c per lb during the Korean War boom to 9c per lb in 1965. A Citrus Marketing Scheme elicited much local interest in 1956-57 when fruit was purchased at 5c per lb, but it collapsed with the unwillingness of retailers in Port Moresby to handle the produce.

241 [464]

(f) Conclusions

In spite of long participation in cash cropping, Orokaiva involvement is not high. Everywhere commercial production remains subsidiary to subsistence, individual cash crop holdings are almost

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[434] [1] Dakeyne 1965:109; Rimoldi 1966:8. Both show, however, that a few individuals earn worthwhile sums from marketing.

[437] [2] Bartered at this rate in salt, tobacco, razor blades and kerosene.

241 universally small and there is no evidence to suggest that any
[464] village producers are employing labour to increase production.[1]

454 Monetary investment at the village level is low and there are
no motor vehicles owned by individuals or groups of subsistence
493 villagers,[2] although a number of villages now possess copra driers
and coffee pulping machines.

407 The foregoing data suggest three main factors, largely unique to the sub-district, which may explain this situation.

464 (i) Labour shortages. Since pacification there have been repeated references to a high proportion of the adult male labour force being absent from their villages. Humphries (1923:203) refers to the Kumusi district being a 'famous recruiting-ground for plantation labourers' at the time of the first world war. Patrol reports after the second world war make periodic references to shortages of manpower in the villages and suggest that the regulation maximum of 30 per cent absent was at times exceeded (e.g. Higaturu 1-1543/44). The establishment of plantations under the ex-servicemen's credit scheme attracted much local labour at a time when returns from wage
[461] labour were considerably higher than those from cash cropping. Many
Orokaiva still prefer wage labour to commercial agriculture as a source of cash.

731 (ii) Consequences of the disasters. The effects of the war and
the volcanic eruption served to accentuate the instability of settle-
433 ment and fragmentation of groups. Resettlement after the eruption took several years in some cases and is likely to have deterred interest in planting commercial trees, at least in the directly affected area, which was the most densely settled part of the Orokaiva region. The findings quoted earlier[3] suggest that the initial Orokaiva adaption to the volcanic disaster was more active

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[1] Since our survey, one Inonda man has taken a job as a driver in Popondetta and employs a labourer at $3 per week to maintain his food gardens. For a description of four Orokaiva entrepreneurs with large holdings of cash crops see Crocombe 1967.

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[464]
[465]
[2] With the single exception of the indigenous ex-servicemen settlers, several of whom own vehicles; imported foodstuffs comprise a significant element of their diet and considerable use is made of outside labour, commonly kinsmen. Payment, however, is often nominal or in kind.

[3] See p.16.A

A,[See Category 731, p.16--Analyst]

Chapter 3

The village economy

433 This chapter describes briefly the Orokaiva pattern of production and distribution, with particular reference to Sivepe and [128] Inonda.[1] Traditionally the villager operated within quite narrowly circumscribed physical limits. Each community functioned largely as an independent subsistence unit, almost all the requirements of [251] life being produced through shifting agriculture and the subsidiary pursuits of fishing, hunting and foraging on its own land. Production was directed almost entirely to immediate and direct consumption, [438] none of the staple foodstuffs except yams lending themselves to storage; exchange was confined largely to kindred within the community or in closely neighbouring communities. Beyond this, minor and informal trade links had developed between some of the inland and coastal peoples, but the degree of inter-dependence established can be considered insignificant.

[436] The contemporary economy comprises both subsistence and monetary sectors, with the former dominating. Most money traffic is with the non-agricultural sector of the national economy and there is little movement of money between subsistence units.

244 (a) The subsistence sector

(i) Production. The pattern of subsistence production is, as yet, little modified by cash cropping, in spite of the latter being based on permanent tree crops which involve substantially different agricultural practices.

Gardens are made in secondary growth where the forest has regenerated over a fallow period of about ten years. Little primary forest survives among the Mt Lamington Orokaiva and, even where it does, secondary growth is preferred for gardening as it is easier [361] to clear. In addition to the shifts in garden locations, many settlements also change sites at frequent intervals, the cycle [184] appearing to be a little longer than the cultivation cycle. All

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[1] More detailed descriptions are given in Crocombe and Hogbin 1963:7-13, Dakeyne 1965:54-92 and Rimoldi 1966:13-28.

433 settlements have access to garden land, hunting and foraging areas
[184] and creeks but there are considerable variations in availability of
these resources, and others such as fish and potting clay. These
variations are expressed in the relative significance of the different elements in the work and exchange patterns of different
communities.

592 Within the community, the household is the principal economic
unit, aiming at self-sufficiency in terms of procuring food, shelter,
clothing and production equipment.[1] Thus, gardens are the responsibility of individual households, and the work group for any activity,
including clearing and harvesting, seldom exceeds its adult members.
[438] Each household produces its own digging-sticks, spears, building
materials, sleeping-mats, etc., but axes, bush knives, cooking utensils and clothing are usually obtained from trade stores. For most
[476] phases of production co-operation between households is of little
importance.

241 A household may maintain between one and five gardens, three
being the mean. These average 0.3 acres in size and are generally
between five and twenty-five minutes' walk from the village. In
some areas, including Inonda and the Yega area, it has recently
become popular to plant kitchen gardens adjacent to the houses,
often containing manioc, sweet potato, cucurbits, pineapple and
even taro. Banana, coconut, breadfruit and 'hingi' (betel pepper)
trees are often planted at random around the periphery of the
village and in the village square.

The process of garden preparation has been described in the
articles cited above.[2] When all but the largest trees have been
felled, most of the debris is burned and the remainder piled around
the tree stumps. There is no preparation of the soil and crops are
planted with the aid of a digging-stick. Gardens are weeded regularly in the early stages, but less frequently as they approach
[417] maturity. In the less densely settled areas where wild pigs are
common, such as Inonda, most gardens need to be fenced; when
[136] separate households have contiguous gardens they usually fence
them simultaneously and help each other in this more often than
in any other garden task.

[262] The staple food plant of the Orokaiva is taro (Colocasia) and
comparatively small areas are planted with the subsidiary root crops
of sweet potato, yams, 'German' taro (Xanthosoma) and manioc. Interplanted with the ground crops are large herbs and trees, such as

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[1] Exceptions occur in the case of the elderly or infirm, who are often supported by an offspring's household, and so frequently live in a house adjacent to one or more of them (see Map 4). A

[2] See p.23.

A, [See Category 102, p. 38--Analyst]

241 pawpaws, bananas, sugar-cane and edible pitpit (Saccharum edule). No rotations are practised, but a garden may be gradually extended so that the period between initial planting and final abandonment may be as much as two years; plants such as banana and pawpaw may survive longer.

Taro is liable to be adversely affected by a lack of soil moisture during the dry season, and at this time people resort to sago or breadfruit[1] and foraging.[2] Yams and Xanthosoma are also more important at this time, since the former can be stored for many months in specially erected yam houses and the latter can remain in the ground for some time without deteriorating.

[262] In Sivepe, animal protein does not form a regular or quantita-
tively significant part of the diet. The principal source is the
[224] domestic pig, and birds and small marsupials which are hunted. In
Inonda and other areas more low-lying than Sivepe, rivers are larger
[226] and contribute considerable quantities of fish to the diet, while
hunting for pigs, wallabies and other marsupials and birds is also
more profitable than in the more densely settled areas.

Since about 1890, new subsistence crops, including sweet potato,
manioc, Xanthosoma, corn, pawpaw, sweet banana, pumpkin and water
melon have been introduced. The Mt Lamington people claim that
[262] yams and sago also are very recent introductions into their area.
The fruits are consumed mainly as refreshments, but the vegetables
have become important in the diet. Sweet potatoes need drier soils
than taro and they mature in about three months. They, with yams
and Xanthosoma, are often planted in special gardens, known as
'sera',[3] as distinct from the ordinary taro gardens, called 'pure'.
[824] The sago palm is still uncommon in the Mt Lamington area and not
everyone is skilled in the extraction of the flour. Its leaves
have, however, displaced those of the bamboo as the principal roofing material.

431
437 (ii) Exchange. The most common transactions are the daily exchanges of food between the households in any Orokaiva settlement. This may be unprepared, cultivated or forest produce distributed on return from the gardens or it may be freshly cooked food given at the time of the evening meal. People also frequently share food, drink or tobacco while working together or on a journey. They do not record these exchanges and each household is assumed to be in a long-term equilibrium with the others.

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[1] Breadfruit is common only in the inland areas.

[824] [2] Particularly for edible leaves and shoots, which are known by the same Orokaiva name (ina) as pitpit.

[3] Such gardens are often only roughly cleared and not weeded, thus reducing labour.

438 [437] consisted in the barter of shells, lime and wooden and clay pots from the coast in return for areca and feathers from inland. Clay pots, shells and feathers are now rarely traded and the coastal people hawk their produce, mainly smoked fish and lime, around the villages and at the markets for cash.

433 All the people's subsistence needs may be produced within the village or by kinsmen or friends in other, essentially similar, villages. The exchange system serves both as a form of group security, in that the aged or infirm or people with gardens temporarily out of production can rely on kinsmen or friends for support, and a means of exercising authority, through the manipulation of the flow of goods and services. Strictly speaking, however, there is no necessary dependence on the production or distribution decisions made by others. In the case of cash and storebought goods, the reverse applies. These originate outside the village economy and in most cases outside the country. Whereas, given the limits of time, resources and convention, a villager may produce as much of any garden or forest item as he desires, he cannot affect the quantities of cash or store goods available, or the rate (through wage and price levels) at which they may be obtained.

(b) The cash sector

434 [443] The main sources of cash for Orokaiva villagers are the sale of cultivated produce, the sale of labour and remittances from kin in employment elsewhere. Since 1959, an additional source has been the ownership and operation of small stores, but so far only about twenty-five men (including some indigenes from other districts) have turned to trading. The relative significance of each source varies greatly from household to household within a village and within the sub-district. All occur irregularly and are highly unpredictable in the level of returns.

● 241 [578] [433] (i) Cash cropping. The cash crops of coffee, cocoa, rubber and coconuts occur in either individually-owned or communal holdings, the former under one of a number of land tenure systems, including customary tenure, the Higaturu Land Registration Scheme and the Land (Tenure Conversion) Ordinance. Individual holdings tend to be small, frequently less than 0.5 acre in size and containing less than 250 trees. The communal holdings are larger, often exceeding ten acres, but, in some cases, they are not worked because of disputes over rights to trees and land. In other cases, they are operated by individuals on a rota system. Plantings are rarely weeded or trees pruned. This applies particularly to the communal holdings, where individuals do not accept responsibility for maintenance. In the older rubber and coconut plantings many of the trees are self-sown. As well as lacking maintenance, in most cases

241 holdings of commercial trees are not fully, and sometimes not at
[433] all, exploited by the owners.[1]

Most have been established on land cleared for the purpose and are seldom interplanted with subsistence crops. However, a 'catch crop' of taro, sweet potato or corn may be taken from the newly cleared land before planting coffee or cocoa and it is only now becoming common to plant commercial trees in subsistence gardens after the food crops have been harvested.[2]

245 The techniques of cultivating and processing cash crops within the village are simple. Coffee is sold in parchment form. In most cases the cherries are pulped by stamping in a creek to split them open, and then the beans are removed by hand and washed. Some villages possess pulping machines. After fermenting for about twenty-four hours in wooden containers, the beans are washed again and sun-dried. A few people erect drying platforms but most simply spread the beans on sleeping-mats in the village square. The buying agency rejects parchment that has not been adequately dried but no price differentials are applied. The coffee season extends from about March to October and people may begin weeding some weeks
474 beforehand. OCGS announces the season's coffee price (as determined by world market conditions) some weeks before buying commences, but
245 few producers learn it in advance and, since they need to begin harvesting a month or two before the time of sale, the element of uncertainty may deter them from maintenance and harvesting even in years of high prices. All coffee is purchased by the society, which is sometimes prevented from buying by lack of funds, lack of transport, or by the poor state of the roads. Buyers may visit only once a month or less.[3] There is scope for an immediate quadrupling of production from existing trees,[4] and more active campaigns and perhaps additional buyers might help achieve this.

245 Cocoa, like coffee, is maintained, if at all, by occasional clearing of grass and weeds from around the trees. Harvesting is carried out immediately before sale - if possible, on the same day.

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[1] The coffee trees in Popondetta sub-district in 1963 should have yielded about 200 tons of polished coffee, but the actual level of output was only 41 tons (DASF, Popondetta, File 1-6-A(4)).

[171]

[2] This practice was followed by indigenous smallholders in Malaysia and Indonesia for two decades and resulted in the planting of millions of acres of rubber by the 1930s. See, for instance, Thomas 1965:101.

[3] In marked contrast to the more densely populated and more accessible parts of the highlands where competition among buyers is keen and some routes are visited daily.

[4] See footnote 1 on this page.

525 the losers. Villagers may also lose a fair proportion of their cash income through gambling.

461 (vi) The use of cash. Income is used for settling obligations,
direct consumption and capital savings. The first includes taxes
to the local government council, contributions to the mission and
marriage payments. These occur only occasionally, but their size
may require that an individual seek wage employment or harvest his
cash crops with the specific purpose of meeting such requirements.
The heaviest demands coincide with and immediately follow the
[651] period of most intensive cash crop production. Between about
[623] March and July the Higaturu Local Government Council collects its
annual tax of $6 per adult male and $2 per female. During the
[797] latter half of the year, the Anglican mission seeks contributions
to its Papuan Church Fund, in some areas recommending gifts of $4
[436] by men and $2 by women. Cash also circulates among villagers in
the form of small gifts as part of the 'normal' exchange pattern.

366 Most villages are within half an hour's walk of trade stores and during the dry season in particular, distinct recourse is made to them for food. Only very small sums are paid out at markets or to hawkers.

454 Opportunities for investing savings occur with two local companies, Oro Ltd and the OCGS, and with the major savings banks through their agencies. In spite of a required minimum shareholding of $5 and $10 respectively, the first two have elicited considerable support and are preferred to savings accounts because interest on the latter is considered too small.[1] In addition to shares, a considerable amount of money is tied up in village or clan savings accounts but there are few instances of this money being used to benefit the group.

241 Apart from the few trade stores and coffee pulpers, little income
is invested in large capital equipment. Herein, perhaps, lies the
[179] anomaly of commercial agriculture in the Northern District. In
spite of the long record of experimentation with various forms of
work organisation and tenure (admittedly, largely directed from
outside), the degree of economic development remains low when compared with the Gazelle Peninsula or parts of the Eastern and Western
[493] Highlands Districts. The proportion of cash croppers among villagers
is lower, as are the actual incomes derived from cash cropping and
there are no locally-owned vehicles (except those of ex-servicemen
settlers). Nevertheless, interest in commercial agriculture is

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[1] One expatriate planter who operates a savings bank agency expressed concern that withdrawals had exceeded deposits for the twelve months preceding mid-1964. He believed that the money was being used principally to buy shares in Oro Ltd.

often high. A large proportion of the ex-servicemen settlers in the sub-district comprises former Orokaiva villagers and, up to 10 December 1964, the DASF in Popondetta had received requests from thirty-five villages in eight different census divisions for the conversion of clan lands to individual cash crop blocks under the 1963 Ordinance. This suggests that intending cash croppers see their best opportunities as lying outside the village environment. In acknowledging this, an important factor is, according to Morawetz (1967:18), the advantage of having a consolidated holding instead of fragmented and often widely scattered plots, which are wasteful in terms of work organisation and therefore productivity per labour unit.

592 The average size of households[1] is 4.5 persons, otherwise expressed as 2.4 labour units.[2] Of the fifteen households in the
sample at the beginning of the survey, only four had individual
[249] holdings of cash crops and one man started a holding during the
survey (coffee in all cases). Everybody had rights of access to
a communal rubber plantation which was tapped by individuals on a
rota system.

464 Most household heads have worked for wages as unskilled or semi-skilled labour (plantation workers, rubber tappers, domestic
servants and labourers for the Australasian Petroleum Company).
871 The highest level of education reached by any householder was
standard II.[3] Standard IV is the highest level attained within
the sample (including children), although one absentee completed
standard VI at a government school at Kokoda.

622 Although the sample includes the local government councillor for Sivepe and the adjoining villages of Binduta and Awala, he only
recently arrived in the village and exerts limited authority.[4]
[241] The village as a whole possesses no universally accepted spokesman
or leader[5] and the repeated failure of communal ventures[6] may be
related to this fact.

Economic holdings

433 Within the subsistence sector, a key factor in the pattern of exchanges is the fluctuating resources of particular foodstuffs in production at a given time in a given household: when an individual has no producing taro he is dependent on others, when he has excess he distributes. Significantly, at the time of the survey of

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[594] [1] For the purposes of this survey, a household is a group of people gardening, cooking, eating and budgeting together. It is basically the nuclear family, perhaps including unmarried kin or widowed or divorced parents (although these may operate as independent households). The household invariably resides under a single roof. Cases of two households living together occur and their frequency in Inonda helps explain the larger mean size of house.

[128] [2] Labour units were calculated on the following basis:

Age	5-9 years	10-14	15-19	20-44	45+
Male	0.1	0.3	0.8	1.0	0.8
Female	0.2	0.4	0.7	0.8	0.6

[3] See Appendix 1.2 .A [4] See Rimoldi 1966:55-6.

[554] [5] One man, adopted into Timumu clan, is asserting himself increasingly through his generosity, organising ability and industriousness.

[6] See pp.44-5 and Rimoldi 1966:84, 107-8.

A,[See Category 871, p. 307--Analyst]

433 subsistence holdings in Sivepe, three individuals had no producing staple foods in their gardens.

592 Three of the fifteen households surveyed comprise only a single member. Two of these were a married couple who were considered, for the purposes of the survey, as separate households on the grounds that the wife lived for only short periods with her husband, dividing most of her time between her brother's and her father's houses instead.[1] The husband and the third individual, an old man, lived in their own houses, although the former abandoned his on departure from the village in August. One widowed woman and her children had no house of their own but shared those of primary kin until the end of March when she left to marry a man in another village. A second family left at about the same time, in search of wage employment. Thus, by November 1964, the number of households had fallen to twelve while for most purposes the separated woman (household 8) had become a member of her parent's household (14).

All the identified households cultivated separate gardens. For most of the survey period, two households had attached to them the wives and children[2] of two men at work outside the District. Both household heads, in establishing a garden, set aside a portion for the sole use and responsibility of these women, as they were expected to contribute to the household's food requirements.

(a) Food gardens

● 241 [125] A detailed survey was made of the holdings of seven households, selected to provide a cross-section of the community in terms of status of head, structure of household and involvement in cash cropping. These data were then compared with that collected by Rimoldi almost two years previously (see Tables 4:1 and 4:2). While the small size of the samples, 11 and 7 households respectively, makes it dangerous to draw conclusions, a few observations can be made.

Table 4:1 reveals a fall of 44 per cent in the average size of holdings planted with taro (Colocasia) and sweet potato. In 1964, the maximum sizes of taro and sweet potato areas were much lower than in 1963. This is offset, however, by very substantial increases to three and nine times (respectively) in the average plantings of yams and Xanthosoma. The holdings of two young household heads were responsible for almost all of these increases.[3]

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[1] i.e. effectively there were only 14 households, as recorded in Appendix 1.

[2] In one case, the daughter of the household head and her son, and in the other, the man's wife and her son.

[3] One has established a yam garden of 0.16 acres and the other a Xanthosoma garden of 0.15 acres.

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Table 4:1

Sivepe: mean garden areas under cultivation, 1963 and 1964*
(acres)

Garden	Per head of population 1963	Per head of population 1964	Per able-bodied person (over 16) 1963	Per able-bodied person (over 16) 1964	Per household 1963	Per household 1964
Currently producing	0.14	0.05	0.27	0.10	0.57	0.20
Planted but not producing	0.12	0.11	0.23	0.20	0.48	0.43
Cleared only	0.10	0.04	0.20	0.08	0.43	0.17
Total area under cultivation	0.36	0.20	0.70	0.38	1.48	0.80

[125]

* Feb. 1963, 11 households, Dec. 1964, 7 households, all of which were included in the preceding survey.

Table 4:2

Sivepe: food plants per household, 1963 and 1964*

Crop		Average 1963	Average 1964	Range 1963	Range 1964
Taro (Col.)	(acres)	0.97	0.54	0.39-2.30	0.40-0.72
Sweet potato	(acres)	0.07	0.04	nil-0.20	nil-0.07
Bananas	(plants)	71	128	35-126	73-231
Sugar-cane	(clumps)	34	40	11-54	21-99
Ina	(plants)	88	54	nil-400	24-104
Yams	(vines)	65	202	nil-136	nil-892
Manioc	(plants)	few	10	few	2-30
Xanthosoma	(plants)	28	252	nil-91	nil-1027
Corn	(plants)	223	65	nil-442	nil-157
Pineapples	(plants)	nil	4	nil	nil-24
Cucurbits	(vines)	13	5	9-28	nil-14
Shallots	(plants)	few	1	few	nil-6
Beans	(plants)	17	15	nil-110	nil-63
Tomatoes	(plants)	nil	1	nil	nil-3

[125]

* Feb. 1963, 11 households, Dec. 1964, 7 households, all of which were included in the preceding survey.

Between the two surveys, cultivated area per head fell (see Table 4:1) to 55 per cent of the figures collected by Rimoldi and close to that considered the minimum requirement for shifting

241 cultivators in New Guinea.[1] This was due partly to changing
emphases in the pattern of work between the two surveys, partic-
ularly the greater amount of time used for external agencies and
in the inception of two communal enterprises (the establishment of
a cash crop garden and preparations for the transfer of the village
[125] to a new site). Three other factors must be taken into account.
Firstly, a slightly different survey technique was employed by
Rimoldi. The 1964 measurements were confined to a single point in
time, whereas Rimoldi measured all the gardens and then added any
extensions which occurred during the survey period (about six
[132] weeks) without deducting any areas which might have gone out of
production. Secondly, 1964 proved to be a highly unseasonal year
at Sivepe in that recorded rainfall in August exceeded that in
December (1,542 and 1,416 points respectively) and the number of
rain days was the same in each month (24). This disrupted the cycle
of agricultural activities and prevented the customary clearing of
forest for new gardens during dry weather. For this reason, figures
for areas planted but not producing (see Table 4:1) approximate
closely to Rimoldi's, whereas cleared and producing areas fall far
short.[2] Thirdly, two household heads within the group surveyed in
1964 had been absent from the village for two to three months before
the data were collected, and third's activities were partially
diverted by his involvement in a contract to build a house at Saiho
hospital, and most of the community were involved for several weeks
in building the new road to Sasembata and in erecting classrooms on
the mission station.

245 (b) Economic trees and livestock

The holdings of economic trees (Table 4:3) indicate their importance for subsistence. Breadruit comprises a very large proportion of the intake of starches at the onset of the dry season and only when most of it has been harvested do the people resort to sago-making. Areca is chewed by almost all adults, while the milk of the green coconut is drunk as refreshment and the meat grated to use in preparing staple foods. Hauga (Canarium sp.) nuts, when in season, are gathered and consumed largely by children.

[136] All economic trees, except for the recently introduced orange, grow wild in the bush but are claimed as individual property. Several, particularly coconut, areca palms and hingi trees, are also planted in gardens and on the periphery of the village.

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[1] See Barrau 1958:32; Brookfield 1962:245, 251; Bureau of Statistics 1963:14.

[132] [2] Similarly, a long unseasonal dry spell occurred during the last few weeks of Rimoldi's survey with the consequent extensive clearing of land for new gardens.

249 245 [578] man-hours, to be a costly failure.[1] During February and March 1964, some 361 man-hours were spent in cleaning the garden preparatory to planting. The major task of clearing the area had been done the previous year. The immediate cause of the scheme's failure was friction between villagers over the crops to be planted in the garden - the councillor insisted on coffee, cocoa and rubber, while most of the others favoured coffee only. Regardless of this aspect, the episode illustrates some of the problems of communication between the external agencies and the indigenous people.

361 Preparations in the latter part of 1964 to move the village to the new site were precipitated in part by the belief that, if located near the end of the new and improved access road (the jeep road from Awala running through Sivepe having fallen into disuse during 1964), the sale of their produce would be made more easy.[2] However, because of the uncertainty surrounding the move, several households had by the end of the year stated their intention of remaining in the existing village.

241 The complexity of the cash cropping situation in Sivepe precludes drawing a clear distinction between cash croppers and non-cash croppers. As Table 4:4 shows, there are various forms and degrees of involvement in commercial agriculture and every household participates in some way. Distinctions drawn on the basis of individual holdings can be most misleading. For example, the head of household 15 is an active cash cropper, although he has no commercial [887] trees of his own, whereas another man, with 77 coffee trees, did not work them at all during 1964. While older people tend merely to assist primary kin and appear to receive little direct payment, others are involved in various ways.

(d) Monetary assets

434 Individual holdings of money and other property reflect the use of past income and illustrate the extent of investment and changes in material culture.

[454] The monetary assets of 11 households at the end of the survey amounted to $208.60 (see Table 4:5), 26.9 per cent ($56.10) in cash

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[1] It is assumed that communal clearing and subsequent subdivision into individual holdings had been recommended. In the Sivepe case, the councillor had apparently failed to grasp that subdivision should follow clearing. Two householders claim to have been prevented from establishing individual coffee plantings by him because of this misunderstanding.

[2] See pp.34 and 37.A According to a local planter, the Army Engineers (engaged at the time on public works in the Northern District) promised to provide a weekly truck to Popondetta market if the people built a new road.

[TEXT CONTINUED ON PAGE 47]

A,[See Category 484, pp. 34-37--Analyst]

554 councillor for the villages of Inonda, Ajoro, Hohota, Hosou and Seva. He is the senior resident member of the traditionally-dominant lineage and the trade store owner. He initiated the building of the copra-drier and takes the lead in most other new undertakings and at times of crisis or dispute, though his views are sometimes successfully opposed. In land matters he defers to or seeks the advice of the oldest male resident.

Economic holdings

241 [126] The data on crop patterns and areas of subsistence gardens are presented with the data for 1962 given by Crocombe and Hogbin (1963:7-10). The figures for garden areas are not strictly comparable, since the 1964 data on garden areas, though not on crop numbers, were obtained by mapping from aerial photographs whereas the 1962 figures were calculated from the results of chain and compass surveys. This latter technique was used in 1964 for mapping the areas under taro and sweet potato. Other crop data were obtained by counts in the gardens. Information on holdings of economic trees and the inventories of household property were derived from interviews and were not checked on the ground, except for trees recently planted in the village surrounds.

[592] Although the mean size of household is 3.9 people, two households contain only one adult. There is considerable flexibility in residence and in arrangements for making gardens. For instance, the mother of the wife of one household head came to settle in the household permanently in July 1964; she maintains her own garden, which was cleared by her son and her daughter's husband. Another household comprises a widower who makes his own gardens and has the highest cultivated area of any household; however, his eldest son's wife, in a separate household, does some of his harvesting and prepares most of his meals. The widower also makes gardens for the widow who heads household 18. This woman lived with her two youngest children until August, when her eldest son and his family (household 21) moved into her house on the new village site. Another garden was made on her behalf by her brother in another village. Household 24 comprised the parents of two sisters who had married Inonda men. At first, they lived with household 23 at the old site but moved in October to join household 21. They maintain their own gardens.

(a) Food gardens

At the beginning of February 1964, the nine Inonda households were cultivating 27 gardens, at a mean distance from the village of 0.5 hours' walking time. In December 1964 the eight households remained after the departure of the Jego'undi man had 29 gardens at a mean distance of 0.3 hours' walking time.

241 In November 1964, the total area cultivated by the villagers was 10.27 acres. Table 4:8 shows the average area for each person, for each able-bodied person over 16 and for each household. The comparable figures for 1962 show that there has been a decline in the cultivated area of 15 per cent per person and per able-bodied adult, and 22 per cent per household, this latter reflecting the smaller mean size of households (3.9 in 1964 against 5.6 in 1962).

Table 4:8

Inonda: mean garden areas under cultivation, 1962 and 1964 (acres)

Per head of population		Per able-bodied person (over 16)		Per household	
1962	1964	1962	1964	1962	1964
0.31	0.27	0.67	0.57	1.47	1.14

Table 4:9 shows the crops produced in the gardens. As in Sivepe, there has been a marked decline (amounting to 49 per cent) since 1962 in the area planted with taro and sweet potato and in the number of sugar-cane and *ina* clumps, but there have been compensating increases in yams and *Xanthosoma* and lesser increases in manioc,

Table 4:9

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Inonda: food plants per household, 1962 and 1964*

Crop		Average		Range	
		1962	1964	1962	1964
Taro (*Col*.)	(acres)	1.3	0.70	0.4-2.6	0.24-0.92
Sweet potato	(acres)	0.2	0.06	nil-0.4	nil-0.18
Bananas	(plants)	81	88	12-145	34-144
Sugar-cane	(clumps	71	31	34-167	17-50
Ina	(clumps)	56	7	4-181	nil-18
Yams	(vines)	24	57	nil-61	4-241
Manioc	(plants)	10	14	4-27	nil-34
Xanthosoma	(plants)	5	39	nil-25	nil-138
Corn	(plants)	72	79	nil-140	nil-204
Pineapples	(plants)	1	17	nil-7	nil-43
Cucurbits	(plants)	2	12	nil-10	5-25
Shallots	(plants)	few	nil	n.a.	nil-4
Beans	(plants)	few	nil	n.a.	nil
Tomatoes	(plants)	few	1	n.a.	nil-6
Pawpaw	(plants)	n.a.	41	n.a.	14-78

* 1962, 8 households; 1964, 9 households.

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592 bananas, corn, cucurbits and pineapple. The change is probably due to the storable qualities of yams and Xanthosoma and the comparatively small amount of attention required during growth by each of the crops showing an increase. The slight increase in corn plantings is due specifically to one man sowing a 'catch crop' in a garden cleared for coffee. The increase in the number of yam vines, on the other hand, is evident for several households. Although two households had no Xanthosoma, the others all exceeded the 1962 average. Of the four households which had more than 20 pineapple plants, two intended to market some of their produce.

245 (b) Economic trees and livestock

[592] [231] Table 4:10 shows the average holdings of economic trees and livestock per household. Following the change in the village site, all householders planted several coconut palms around their homes

Table 4:10

Inonda: economic trees and livestock, 1964

245 231 592

Item	Average per household* Bearing**	Average per household* Planted in last year	Range (bearing only)
Breadfruit	3	nil	nil-18 trees
Areca palm	1	6	nil-8 "
Coconut	17	25	6-35 "
Hauga	1	nil	nil-3 "
Pandanus	5	nil	nil-16 "
Sago	4	nil	nil-9 "
Mango	1	nil	nil-2 "
	Total		Range
Pig	2		nil-1 animals
Dog	6***		nil-2 "
Cat	2		nil-1 "
Fowl	7		nil-3 "

* Eight households only. Information was not obtained for one household, a widow originating from Urio village. It is unlikely that she possessed rights to trees in Inonda (cf. Crocombe and Hogbin 1963:47), although her sons would.

** One householder claims extensive holdings of the specified trees on the lands of his home village of Hohorita. These holdings, which he did not exploit during the survey and which are excluded from the above figures, include: coconuts, 30; areca palm 10; sago, about 50; breadfruit 20; pandanus, at least 50. The claimant is the sole survivor of a large family killed when Mt Lamington erupted.

*** Including 3 pups.

556 [251] [241] [431] [437] An important status indicator is the size of an individual's yam holding. Yams both enter into ceremonial exchanges and are stored for consumption during the dry season when garden foods are in short supply. Compared with taro, work on yams is 'hard' and not everybody grows them. In harvesting the owner seeks assistance from others and the services so rendered are normally reciprocated in the form of gifts of yams rather than the subsequent rendering of an equivalent labour service. The more assistance an individual can solicit the greater his potential capacity to increase his yam 433 holding and so increase his standing in the community while meeting some of the needs of those without yams. In such a case there is no limit to the individual level of production although there is in demand of the group as a whole. However, there is no evidence to suggest this demand is met since annually people must resort to the production of less favoured foods such as sago to satisfy require- [241] ments. This suggests that the customarily defined span of activities may be so great as to leave the people without the capacity to satisfy their demand for yams, although the exchange system functioning through the network of ceremonial and leisure activities does permit the more even distribution of scarce resources among the group and provide its individual members with a higher degree of security than they would otherwise have.

121 Disregarding the merits of Fisk's hypothesis as applied to pristine subsistence communities, virtually all are now elements in much broader political, economic and religious systems. This is directly reflected in work patterns where novel demands are made on the people's time and the level of out-migration by adult males leaves a heavier work load for those remaining behind. As the linkages with the external sector become more effective so these features, which may be largely unrelated to the increasing commercialisation of the economy, become more significant. On these grounds Salisbury's thesis (1962) that the change from a stone to steel technology has resulted in a considerable saving of labour time in certain axe-using activities cannot usefully be presented as additional evidence for the availability of labour for commercial activities.

A final reason for making a comprehensive study of activity patterns is to test the assumption that the particular nature of organisation in subsistence agriculture is well suited to the grafting on of commercial activities. In considering tillage, animal husbandry and construction in traditional societies Udy (1960:85) states:

> None of these processes ordinarily requires the individual attention of members of the production organisation. It is perfectly possible to cultivate a field, tend a herd, or build a house, and be carrying on some other activity during the same period. In fact, in tillage and animal husbandry there are limits beyond which more exclusive attention to the process

164 [404] [734] man-hours were absorbed by clinic visits and related public health activities. So, grouping all three categories together, sickness accounts for almost 7 per cent of potential activity time.

In analysing the 212.4 man-days spent inactive, Fig.6:1 indicates that 26 per cent fell during two weeks in period I when an influenza epidemic swept the area. It is during the latter part of the wet season that sickness reaches its most serious proportions, accounting for 7 per cent of potential activity time. Malaria, being endemic, is the most common cause along with other parasitic diseases of a debilitating nature; hence the seasonal pattern.

Table 6:3

Sivepe: incidence of sickness according to sex, age and cash cropping status

	Sex		Age				Cash cropping status	
	M	F	15-24	25-34	35-44	45+	Yes	No
Percentage of days sick to total survey days	5.1	4.2	2.3	2.0	1.5	8.3	1.8	8.8

[1C2] Table 6:3 shows that the older people suffer most and also that non-cash croppers spend a significantly higher proportion of their time sick than cash croppers. While this is largely because the heads of non-cash cropping households are, on average, older than the others[1] it may well be that the non-cash croppers, lacking the initiative of the others, more readily assume the sick role.

512 Temporary absences apart, 4,990 man-days were spent in Sivepe, and during this time the villagers' activities occupied 28,975 hours, or 5.8 hours per man-day. Furthermore, virtually all these activities, except hunting, certain social activities and, occasionally, house construction, were confined to the daylight hours.

Patterns of activity and seasonal influences

512 433 ● 241 The adult residents of Sivepe are active, on average, 40.6 hours per man-week, although, as Fig.6:2 demonstrates, there is a substantial variation from week to week. The actual range during the observed period was 34.4 to 51.3 man-hours.

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[1] Of the 11 households resident throughout the survey the heads of the non-cash cropping ones are all in the 45+ age bracket while only 2 of the 7 cash cropping ones are.

512 433 ●241 Such weekly variations can, in part, be correlated with rainfall (see Fig.6:5), less work being done in wet weather as virtually all Orokaiva activities are pursued out of doors; even cooking, weather permitting, is done in front of rather than inside the house. However, while the labour requirements of certain activities vary little from week to week, others are restricted to particular parts of the year or are in response to specific events, and it is these extraordinary activities which commonly account for the weekly variations in activity time.

(a) The subsistence sector

(i) Food production. Subsistence activities predominate, accounting for 30 of the 40.6 hours expended per man-week (see Table 6:4), and within these gardening is the most important single category involving 13.2 hours with bush clearing another 3.7 hours per man-week. Nine hours of the gardening time are spent on the cultivation of the staple food crop, taro.

Although the data provide little evidence for any relationship between the pattern of gardening activities and climatic seasonality,
[461] this may be accounted for by the absence of a distinct 'dry' during 1964 (see Fig.6:4). The Sivepe people speak of the dry season as,
[262] traditionally, a 'time of famine' and intensification of work when their taro gardens are not producing and they are obliged to resort
[251] to wild yams and breadfruit for sustenance, together with the cultivated yams harvested and stored during the preceding wet season. While acknowledging that this has been substantially modified with the introduction of Xanthosoma and sweet potatoes, and the increasingly common practice of sago extraction, the fact that August 1964 proved to be a wetter month than December in Sivepe[1] results in a less well defined seasonal pattern being presented by the data than might otherwise have been the case.

[221] New garden sites are cleared throughout the year but preferably following dry spells of a week or more for successful burnings. However, there are few taro tops available for planting during the dry season itself. Table 6:4 shows that the most intensive clearing took place during period I, with 4.4 hours per man-week. This figure includes 0.8 hours expended on the communal garden and the time spent on clearing for subsistence therefore approximates more closely to the figure of 3.3 hours for period III, the early part of the wet season.

The time devoted to subsistence gardening tends to increase during the survey. However, in comparing taro, yam and sweet potato, distinct patterns of activity emerge. In taro cultivation

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[1] 15.42 and 14.17 inches being recorded respectively.

[TEXT CONTINUED ON PAGE 83]

8: Waddell & Krinks E-4,5 (1964-1965) 1968 OJ23 Orokaiva OJ23

Table 4:4

Sivepe: participation in cash cropping, by household

Household no.	1	2	3	5	6	9	10	11	13	14	15
Individually owned coffee trees	57	-*	77	-	-	246	-	-	123	-	-
Currently exploiting coffee directly	yes	yes**	-	-	-	yes	-	-	yes	-	yes***
Closely assisting in exploiting coffee	-	-	-	-	-	-	yes	yes	-	yes	-
Exploiting rubber	-	-	yes	yes	-	-	-	-	yes	-	-
Recent attempt to establish individual rubber holding	-	-	-	-	-	-	-	-	yes	-	yes
Currently establishing coffee	-	-	-	109†	-	-	-	-	-	-	-
Participant in communal garden	yes	yes	yes	yes	yes	yes	-	-	yes	yes	yes

* 'None' or 'not applicable'.

** His son's (household 3).

*** The head of this household has access to the coffee of household 13 as a result of having asserted a claim to it. Household 13 had acquired the coffee in the individualisation of a communal planting established about 1956. See Rimoldi 1966:84.

† Staked out only. The trees will belong to the daughter's husband, who is currently attached to the household.

Note. Tables 4:4 to 4:7 refer only to the 11 households resident in the village for the entire survey period, with household 8 incorporated in 14.

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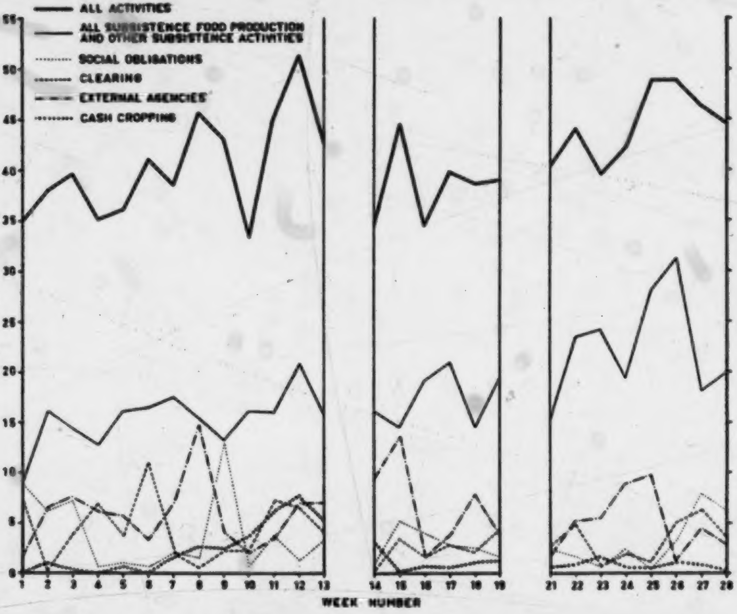
SIVEPE

WEEKLY PATTERN OF ACTIVITY - ALL ACTIVITIES AND SELECTED GROUPS

FIGURE 6:2



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SIVEPE
WEEKLY PATTERN OF ACTIVITY-SELECTED SUBSISTENCE ACTIVITIES

FIGURE 8:3

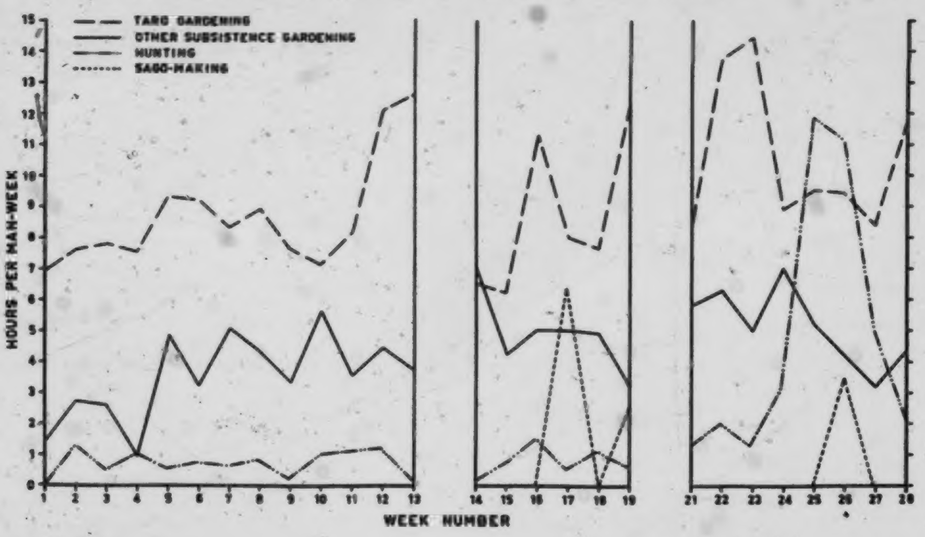
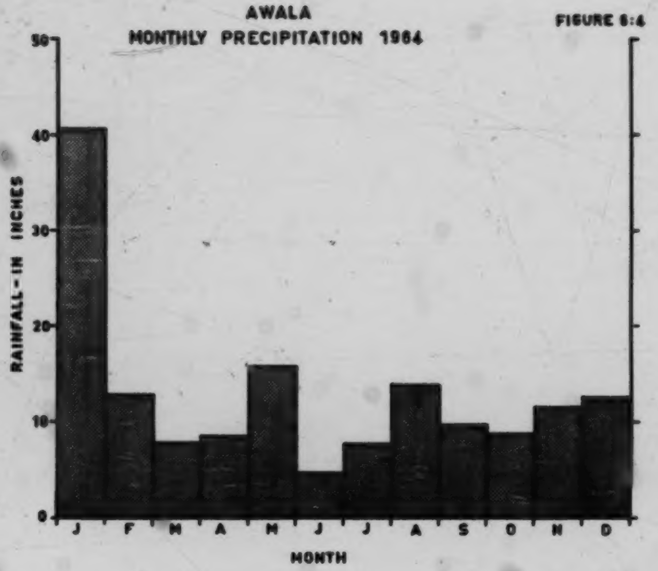


FIGURE 8:4 132



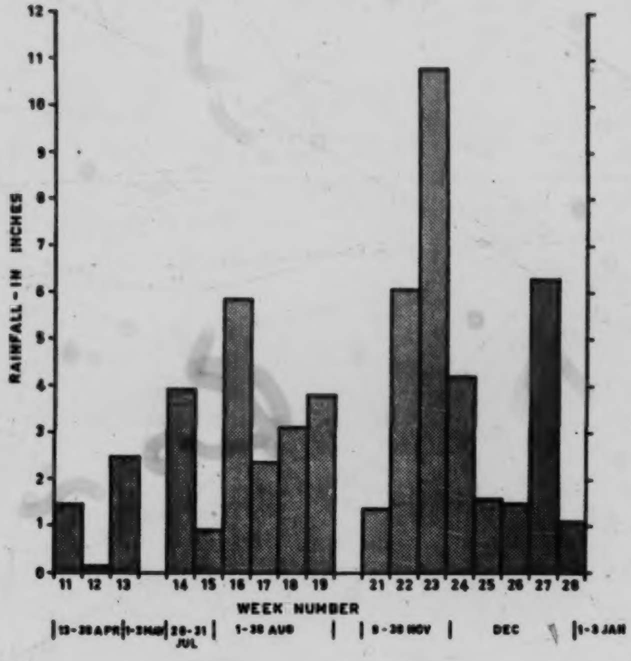
much time is spent in planting and, more particularly, maintenance, 512
unlike the other crops, which suggests that their labour require- 433
ments are much lower.

In spite of the atypical weather experienced during 1964, harvest- 241
ing patterns vary for the several crops. While time devoted to taro
cultivation always exceeds that of the other two crops, harvesting [221]
falls off markedly during the dry season. In contrast, the time
devoted to the harvesting of sweet potato increases steadily through [251]
the survey, while that of yams is confined almost entirely to the
wet season when large quantities are stored in specially constructed
yam houses (or occasionally in holes in the ground).

As with the sweet potato and yam, work on the minor crops and economic trees is restricted almost entirely to harvesting their products - 1.6 hours per man-week. Ina, pitpit, bananas, sugar-cane, areca, coconuts and breadfruit are the major items in this category.

SIVEPE

WEEKLY PRECIPITATION (WEEKS 10 TO 28 ONLY) FIGURE 6:5



512 433 124 [221] Some, such as coconuts, bananas, areca and ina, are gathered throughout the year, but pitpit is collected and eaten primarily during the latter part of the wet season, while the harvesting of breadfruit is confined almost entirely to the dry season. It is at this latter time alone that activities connected with the minor foods assume some importance. During period II, 3.4 hours per man-week were devoted to the harvesting of other crops and products, over 60 per cent of this being for breadfruit alone.

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Table 5:4

Sivepe: mean time spent per man-week on all activities in each recording period
(hours per man-week)

Group	Activity		Period I	II	III	Survey
Clearing			4.4	2.4	3.3	3.7
Subsistence gardening	Fencing		-	-	0.2	<0.1
	Taro	- plant	1.9	2.8	3.0	2.4
		maintain	3.0	3.9	4.5	3.6
		harvest	3.4	1.9	3.0	3.0
		market	0.1	-	-	0.1
	Sweet potato	- plant	-	-	<0.1	-
		harvest	0.7	1.1	2.4	1.3
		market	0.1	-	-	0.1
	Yam	- plant	0.6	-	-	0.3
		maintain	-	-	0.2	<0.1
		harvest	0.8	0.1	0.6	0.6
	Minor crops	- plant	-	0.1	<0.1	<0.1
		maintain	-	-	0.1	-
		harvest	1.0	3.6	1.1	1.5
		market	<0.1	-	0.3	<0.1
	Total		11.8	12.5	15.6	13.2
Other subsistence food production	Fishing		0.2	-	0.5	0.2
	Hunting		0.7	0.8	4.8	1.8
	Sago-making		-	1.5	0.4	0.4
	Total		1.0	2.3	5.7	2.5
Other subsistence activities	Preparation of tools and equipment		0.3	-	0.5	0.3
	Construction		2.2	1.6	0.6	1.6
	Total		2.5	1.6	1.1	1.9
Household	Washing		<0.1	0.2	0.3	0.2
	Cooking		4.8	4.6	5.1	4.8
	Collecting firewood		0.2	0.5	0.3	0.3
	Total		5.1	5.4	5.7	5.3
Social obligations	Marriage		-	0.2	-	-
	Death		1.7	0.9	0.2	1.1
	Other		0.8	0.7	1.7	1.0
	Visiting		1.3	1.0	1.3	1.2
	Total		3.8	2.8	3.2	3.4
Cash cropping	Coffee	- maintain	0.2	-	-	0.1
		harvest	0.9	0.2	-	0.5
		process	1.0	0.3	-	0.6
		market	-	0.5	-	0.1
	Rubber	- harvest	0.1	<0.1	0.5	0.2
		market	-	-	0.1	-
	Total		2.2	1.1	0.7	1.6
Paid work			2.0	1.2	1.0	1.6
Sick	Personal		0.5	0.2	1.2	0.6
	Care of sick		0.3	0.2	0.2	0.2
	Total		0.8	0.4	1.4	0.9
External agencies	Purchasing		0.2	0.4	0.7	0.4
	Council work		0.9	1.8	1.0	1.2
	Meetings		1.3	0.5	1.8	1.3
	Church work		0.3	0.3	0.1	0.2
	Church services		3.1	3.7	1.2	2.7
	Total		5.9	6.7	4.8	5.8
Miscellaneous	Recreation		0.1	0.4	0.4	0.3
	Other		0.1	-	1.1	0.4
	Researchers		0.3	-	0.2	0.2
	Total		0.6	0.5	1.7	0.8
Total - all groups			40.0	37.5	44.2	40.6

252 [461] gardens. If absolutely necessary it will be made without outside assistance, such being the case with one household with inadequate food supplies in its gardens in period III because the head had been absent for several weeks earlier in the year.

241 [262] (ii) Seasonality and the pattern of subsistence food production. While no significant 'dry season' occurred during 1964, the data gathered suggest that the cycle of agricultural activities is partly designed to allow for a dry spell at mid-year. During period II little taro or yam were producing and breadfruit and sago replaced these as the major contributors of carbohydrate to the diet. Yet an agricultural system which is characterised by a period of food scarcity was disrupted by unseasonally wet weather. Heavy rains deterred people from carrying out routine garden tasks, including food gathering, and probably accounted for the postponement of sago-making. On a number of nights during this period evening meals were not prepared because of rain and individual families went to bed hungry.

433 512 [432] (iii) Marketing of subsistence produce. This is only a minor activity amounting to 0.3 hours per man-week. Food crops may be sold either at the weekly market at Saiho hospital or exchanged for trade goods at Sasembata mission station, but their rates are so low that there is no systematic production of food crops for sale to these bodies.[1] Although more favourable prices probably obtain at Popondetta market, distance and lack of transport preclude the Sivepe people from selling there.

(iv) Other subsistence activities. Other subsistence activities comprise the preparation of tools and equipment and house construction. Handicraft work only accounts for 0.3 hours per man-week and primarily involves the preparation of axe handles, spears, traps and nets for hunting, troughs for fermenting coffee, a variety of mats and bags made from woven palm leaves, and various decorative items of a ceremonial nature.[2]

While mats and bags are made throughout the year, the other tasks are largely related to seasonal and specialised needs, the peak (0.5 hours per man-week) occurring in period III with the preparation of hunting equipment and ceremonial dress for the Christmas festivities.

Forty per cent of the time spent in the preparation of tools and equipment is taken up by ceremonial goods, 25 per cent by woven baskets and mats, and 20 per cent by traps, nets and spears for

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[1] See p.20.A

[462] [2] String bags have been excluded on the grounds that, although probably the most important piece of equipment, the women usually make them in the course of doing household tasks.

A,[See Category 435, p.20--Analyst]

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Plate 5. Men are responsible for the initial clearing of a new garden site. Boys acquire the appropriate skills by assisting their elders.

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Plate 6. Women are responsible for the final preparation of the garden site prior to planting. Here, following an initial burn, the debris is being piled around the tree stumps and larger timbers to burn them a second time.

Patterns of activity and seasonal influences

An average of 43.5 hours per man-week are spent on all activi- 512
ties.[1] However, the general level of activity and distribution of 461
time varies widely from week to week and also, in some cases,
seasonally (see Table 7:3 and Figures 7:2 and 7:3).

(a) The subsistence sector

(i) Food production. Subsistence gardening is the most import- 241
ant category of activity, accounting for an average of almost 12
hours per man-week. Over half of this time is devoted to taro [433]
cultivation, except during the dry season when planting and, in
particular, harvesting of taro are reduced, although maintenance
increases. Over the year as a whole, the time spent on taro is
almost equally divided between planting, weeding and harvesting.
For the other crops, however, little time is spent on weeding and
most attention is given to harvesting. This is true of sweet
potato and yam, which are usually grown in specialised gardens, as
well as of minor crops such as corn, cassava and banana which are
usually interplanted with taro. Yams are planted late in the year
and harvested in the dry season. Sweet potato is planted both in
the dry and early in the wet season, the latter being the main
harvesting period, before taro is in full production. Over one-
fifth of the 2.1 hours per week spent on minor crops involves
coconuts, another fifth bananas and 18 per cent sugar-cane. Eleven
per cent is devoted to pitpit but this crop accounts for one-quarter
of the total during the wet season. Cultivation of plants that
provide edible leaves (*ina*) accounts for 9 per cent of the time [824]
spent on minor crops over the survey, but 29 per cent in the dry
season. Corn and pumpkin account for about 5 per cent each.

Clearing of gardens takes place throughout the year, most in dry
spells at the onset of the wet season when newly planted crops will
benefit from the rain. In February and March 1964, during the wet [133]
season, there was an unusually high rate of clearing after a flood
in January destroyed several gardens containing maturing crops.
During period II (the dry season), the rate of clearing was com- [417]
paratively slow, partly because the season was abnormally wet and
partly because of the large amount of time invested in fencing,
which is necessary particularly at this time since feral pigs from
more remote bush areas tend to invade the gardens for food. Clearly,
the protection of growing crops has a higher priority than the
establishment of new gardens.

During the dry season, food-producing activities other than 252
gardening increase in importance, and sago-making is concentrated 221

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[1] See, however, the adjustment for additional data, pp.136, 138.

[TEXT CONTINUED ON PAGE 133]

Chapter 8

The two villages compared

433 ### (a) Levels of activity in relation to available resources

184 In expending an average of 43.5 hours per man-week the Inonda villagers are slightly more active than their Sivepe counterparts, but the difference relates to the subsistence sector. Although both are communities of cultivators with taro the staple crop, the supplementary food producing activities are substantially more significant in Inonda, with fishing particularly important during the wet season. This more diversified economy partly explains the higher level of subsistence activity at Inonda (see Table 8:1). A

More time is required to achieve subsistence at Inonda, principally because of the journey to work: 25 per cent of all activity time is devoted to travelling, even at the new site, compared with only 15 per cent at Sivepe.[1] Thus, if time spent in travelling is deducted, the difference between the two villages is eliminated, Inonda spending 25.1 hours per man-week on subsistence and Sivepe 25.5 hours.

Environmental differences provide some explanation for Inonda's
subsistence economy being more diversified and the location of
activities more dispersed. Not only are the soils around Sivepe
of a uniformly high agricultural value but all the land is forested
[311] and therefore potentially available for cultivation. By contrast,
the soils at Inonda are of variable quality and at least one-third
of the total area is grassland and therefore unavailable for cul-
tivation according to present practices, while even some of the
forested areas are unsuitable due to the infertility of their soils.
[241] Most Inonda gardens are made on a land system covering only one-
fifth of the total area. Probably on account of this generally
lower soil fertility, the fallow period at Inonda is about ten years
compared with only six at Sivepe and, using Crocombe and Hogbin's
and Rimoldi's estimates of the garden requirements per head of

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[1] The contrast is even more marked if the uncorrected percentages are used - 32 per cent and 18.3 per cent respectively.

A, [See Category 461, p. 171--Analyst]

433 184 [24] [222] population in the two villages, it is estimated that the total land requirements per person in Sivepe are therefore only 2.5 acres compared with 14.8 acres in Inonda.[1] Given the lack of uniformity in the hinterland of a village which is located at the forest-grassland boundary, where subsistence is primarily derived from the forest and where garden land requirements are high, it is to be expected that travelling times would be higher for Inonda and that the economy should be diversified by using the non-cultivated areas. There are abundant sago palms in the swamps fringing the rivers and, in the absence of breadfruit (numerous in the cultivated areas at Sivepe), these are exploited in the dry season to compensate for the scarcity of garden foods. In fact, Inonda experiences both a drier and more distinctly seasonal climate and this, together with the greater abundance of land, accounts for the greater significance of supplementary food producing activities. Only hunting is practised to much the same degree in the two villages.

461 The transfer of Inonda to a new site did not lead to the expenditure of substantially more time on construction than in Sivepe, where the normal rhythm of repair and rebuilding was in operation. Since it is estimated that in Sivepe 0.7 of the 1.6 hours per manweek spent on construction are restricted to repairs and minor extensions to existing houses it seems that in Inonda, with the transfer in village site, such maintenance work ceased and the labour time so made available was directed entirely to constructing new houses. In effect, therefore, such moves are not as time-consuming as might be expected.

The external sector of the economy absorbs 26 per cent of total activity time in Sivepe and 23 per cent in Inonda, but in both cases [m] only about one-third of this is directed towards cash production. Rather more time is spent in dealings with the external agencies, particularly in Sivepe by virtue of its proximity to a mission station and location in a densely populated area which is more frequently the focus of Administration and commercial interests.

433 184 In Inonda paid work is considerably more important than cash cropping, but it is essentially of a casual and temporary nature

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[1] The estimation of land requirements is derived from the following formula (adapted from Allan 1949):

$$100\,\frac{CL}{P}$$

where:

P = percentage of the group territory that is arable under the given technology.
C = number of annual garden areas utilised in the agricultural cycle of cultivation and regeneration.
L = acreage of cultivated land per head of population per annum.

three elements of change, first, a trend towards the amalgamation of hamlets into larger units which assume the formal layout now characteristic of Sivepe, second, considerable mobility of settlements, and third, a high degree of individual mobility. However, the first and second he considers to be largely a function of Administration pressures and of ill-defined aims to improve the economic base of their livelihood (as is characteristic of Sivepe's intended move), and the third to be related to the 'vicissitudes of social relationships' rather than to any connection between settlement and garden sites.

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The changes which have taken place in the range and relative importance of subsistence crops largely reflect the need to find a more reliable and adequate food supply during the dry season, although the tendency to increase the acreages of both yams and *Xanthosoma* at the expense of sweet potato and taro might also reflect a conscious effort by some to economise on time and effort in the subsistence sector.

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The survey of activity patterns reveals little variation within the samples in the relative importance of the subsistence and external sectors: even those most strongly oriented to cash cropping are concerned first with achieving subsistence. The two most active people in the Sivepe sample, Linton and Palminus, register an above average level of activity through the whole range of tasks, the manner in which they allocate their time being proportionately little different from that of the sample as a whole. This applies equally to the entrepreneur in Inonda, who spends over half his working week in productive subsistence activities. His entrepreneurial activities are directed primarily towards a trade store which is not particularly demanding in terms of his time. In this respect his cash-producing preferences parallel those of other men where contract or casual work is preferred since, in the absence of strict schedules, it conflicts little with the requirements of the subsistence routine.

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There is little difference between attitudes toward cash and toward subsistence crops. In particular the attention given to the commercial trees parallels that given to coconuts, *areca*, breadfruit and other economic trees associated with the subsistence sector in that, apart from planting and harvesting, maintenance is essentially restricted to facilitating access. The absence of any specialised techniques of arboriculture is carried over from subsistence to cash crop trees, the only distinction being that the cash crops are planted in formal stands. The work routine is much the same in that sustained and regular effort is neither required or given and the duration and intensity of individual periods of cash cropping work differ little from that for productive subsistence work.

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437 431 of each in the food pattern, the proportion of total production of goods entering into the distributive system varies considerably, being related to both its degree of scarcity and the circumstances of the exchange.

[241] [262] Taro, being the staple food, is normally readily available to all households from their own resources and it is estimated that only about 4 per cent of total production enters into distribution.[1] Of this figure over half (56 per cent) circulates within the village, usually in the form of individual plates of cooked food distributed after the evening meal is prepared. These evening distributions are initiated by the first to prepare their meals, and offered to those returning later to help allay hunger until their own food is ready. While the principle of reciprocation applies on such occasions individual exchanges are not accounted for. This applies equally to areca, lime and pepper which are casually distributed at gatherings.

Of foods which are resorted to in the dry season, particularly sago and breadfruit, a much higher proportion of total production enters into circulation. Well over half the sago produced is distributed, specifically to compensate for assistance rendered in its working, but more generally in recognition of the general scarcity of food and of an obligation among those endowed to share their stocks with the less fortunate. Even in such instances, however, the manner in which it is distributed stresses particular relationships.

431 23 224 [262] Custom requires that an individual should not eat the meat of a pig which he has reared himself or of wild game which he has caught. Consequently virtually all meat 'produced' enters into the exchange network, the only observed exception occurring when a pig breaks into a garden and the owner endeavours to kill it himself. Even in

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[574] [128] [1] This figure was determined by using yield data gathered in Sivepe during 1961-62 by the FAO Survey of Indigenous Agriculture. It was estimated that 159 persons produced 298.1 tons of taro in one year from 51.4 acres. Assuming the acreages to be constant the FAO survey estimates an individual requirement to be 0.34 acres per annum and Rimoldi (1966:20) estimates 0.36 acres - a yield of 5.5 tons per acre is obtained. (This includes area under other crops, but taro accounts for 80 to 90 per cent of the total acreage and it is assumed this proportion is constant.) Thus one individual produces 1.87 tons from 0.34 acres.

Using the ratio 70:36 of adult to individual acreage (Rimoldi 1966:19) an adult produces 3.63 tons from 0.66 acres. The present survey covered 4,741 adult-days (man-days) or 12.9 adult years. A yield of 46.8 tons was therefore obtained. During the same period 1.9 tons of taro - 4.1 per cent of total production - was disposed.

[TEXT CONTINUED ON PAGE 187]

When the Japanese landed at Gona Mission in July 1942, all the 648
Yega - men, women and children - fled into the bush and made their 722
way to Ambasi, 30 miles to the north-west. There they lived for
the next two years, returning to the Gona area in 1944. By 1950 361
they had settled down again on their seven traditional village
sites along the coast between Cape Killerton and the eastern end
of Holnicote Bay. One new village was established at Surilai on
Cape Killerton.

Clan membership determined the village of residence of each 621
family in the Yega tribe. In some instances, place of residence 614
was determined by membership of a particular sub-clan. Of the
eight Yega villages, four were inhabited by male members of more
than one clan. The remaining four villages were each occupied by
members of only one clan and their wives and children.

After an abortive attempt at communal farming in 1947-52, the 361
large village of Beporo was brought into existence under the 178
direction and guidance of two educated young men who taught that
a large village close to the mission church, school and hospital 62
was the 'civilized' form of settlement. Some three quarters of [241]
the Yega people, apart from those in wage-work away from home, [166]
moved to Beporo village which was expanded to accommodate them.
Although a broad pattern of clan residence could still be re-
cognized in Beporo, the clans themselves began to lose their [614]
functional identity within the tribe. There was a weakening of [602]
traditional kinship patterns of co-operation in everyday activi-
ties.

Although their earlier communal farming venture had failed, the 178
Yega were still very much attracted to the idea of making money 245
from cash crops. Accordingly, with the advice of the District 242
Agricultural Officer (D.A.O.), they cleared 15 blocks during
1957-8 and planted them with coffee trees. These blocks ranged [654]
from a quarter of an acre to two acres in area; one was planted
by a group of six relatives, the remainder by individuals of
various clans.

For the most part these coffee blocks were cleared in areas of [242]
secondary forest which normally formed part of the land rotation
cycle for food crop production. Although they were located at [591]
distances of up to four miles from the blockholders' villages,
only one man changed his place of residence as a direct result of
establishing a coffee block. This man moved to Gatara, two and a
half miles inland from his previous home and established a single-
family homestead, a settlement quite out of keeping with traditional
Yega practice. The coffee scheme failed, partly on account of low
prices received for early pickings, and partly because in 1960 a
much more ambitious cocoa-planting scheme, the so-called Yega
Scheme, was begun. It absorbed most of the energies of the Yega
during the following two or three years.

Work patterns

Traditionally among the Yega members of one lineage worked together to clear the forest in preparation for planting food gardens. The cleared patch was subdivided among those who helped with the work. Planting and caring for the growing crop was the responsibility of the individual and his family. This traditional pattern was modified when clearing rain forest for the Yega Scheme when the able-bodied men of all lineages worked together. The cleared blocks were then allocated by ballot and the individual concerned was responsible for planting shade trees, laying out a seed bed, planting out the young cocoa trees, 'lifting' shade as the trees increased in size, and keeping down the weed growth. In most instances, relatives who helped the blockholder with these tasks were compensated. For example, the cocoa pickings on 29 July (see Table 1) by Aubrey and John Livingstone were made from the same blocks as those by Ethelbert and Livingstone on 1 July. Aubrey is a member of the same lineage as Ethelbert and John Livingstone is a son of Livingstone. As part payment for work done previously on the blocks these two men were permitted by the blockholders to harvest one month's cocoa production. Other relatives who had helped with the work would be given a similar privilege.

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Late in 1962 and early in 1963 many Yega moved their homes to the new villages of Ononda and Binjapada (see Table 5),[A] the reason given in every case being to live closer to their cash-crop areas. In January 1963, however, the move had not resulted in a significant increase in the amount of time spent on the cocoa blocks.[1] This was because of the time spent building their new houses. Only one man out of 12 spent any time working on his cocoa block during the period 14-28 January. The remainder divided their time about equally between building and work in their food gardens, which were scattered between the coast and the new cocoa blocks.

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Several attempts were made to introduce communal labour into the production of cocoa. The first was organized by a blockholder, Wilfred Upena, early in 1963. He and 17 others belonging to five different Yega clans agreed to do a day's communal work clearing rain forest to extend each man's block in turn. As the originator of the scheme, Wilfred's turn was first and an acre of rain forest was cleared on his block on the first day. But on my return a year later no further communal work had been done by the group.

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464
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[614]

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[1] An unsupervised record of daily work was kept by a man living at Ononda from 14.1.63 to 28.1.63, but it was of only limited value.

A, [For Table 5, see Category 166, p. 43--Analyst]

361 166 followed by the holders of blocks 14, 18 and 46.[1] In the development of the new settlement pattern at Binjapada, the existence of an elongated grassland area lying roughly parallel to the cocoa blocks cannot be ignored. The absence of such a grassland area in the vicinity of the western section of the cocoa blocks was one of the main reasons why no similar 'shoestring' village developed there. Holders of blocks in the western section built their new homes either in the village of Ononda or in smaller hamlets beside the Gona-Popondetta road at distances up to two miles from their blocks. Those who built in Ononda were in general men with no previous cultivation rights to garden land close to the cocoa 361 166 blocks. After establishing their homes in Ononda village most of these villagers cleared rain forest in the Ononda area, thus establishing their cultivation rights to nearby areas of land. 241 423 Villagers who established new homes along the road, on the other hand, in most instances built upon or near to land over which they possessed cultivation rights. To the men in this group, proximity to food gardens was a powerful subsidiary reason for moving inland.

Extension of the Yega Scheme

178 245 The foregoing description shows that the Yega Scheme was a major factor in recent changes in Yega land use, land tenure, cash income, work organization and place of residence. The process begun by the Yega Scheme generated further change, particularly amongst those Yega who did not obtain cocoa blocks at Ononda.

245 In February 1963 many Yega were disappointed because they had no individual area of cocoa. It had already become apparent to most of them that a half or quarter share in the block of a relative would return them very little income; all those who had missed allocation of one of the Ononda blocks were, therefore, very eager to clear a further block. Clearing did, in fact, begin on a new block parallel to and south of the Ononda block, the week the author left the area in mid-February 1963. However, very soon after this, the Yega organizer of cocoa planting, Napoleon Aiga, was posted by D.A.S.F. to another district, and instead of continuing with another 'block' development, people began clearing and planting in scattered blocks. Seven blocks totalling about eight acres were planted in this manner. Several aspects of these plantings require comment.

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[1] According to the author's rough pace and compass traverses, two of these men had in fact built their dwellings on neighbouring blocks. Accurate surveys were therefore needed in order to avoid future difficulties.

245 423 All plantings were made on the south side of Ononda Creek in the area which the Yega claimed because it was their Bowori (extinct) clan land but which the Ahora also claimed by right of conquest. The Yega decided to reinforce their claim by occupying at least a portion of the disputed territory (Fig.7).

241 245 423 (614) (613) A large area of rain forest was cleared for food gardens in addition to the cocoa blocks planted. Permission to clear was in all instances given by the land controller, Nixon Kairembora. Swiddens were cleared by members of Sambori (1), Jambapa (5), Konambo (1), Eupu (1) and Seseko (3) clans. Cultivation rights to the land on which these swiddens were made would then be vested in the lineages to which the individual gardeners belonged.

166 361 245 241 One instance of change of residence as a result of these new clearings was noted. Three Jambapa brothers built their homes on Jamberoda grassland near which they had cleared a swidden and planted food crops and cocoa (about half a mile south of Ononda village and well into disputed Yega/Ahora territory). These houses were the furthest extension of the ribbon pattern of settlement developing along the Gona-Popondetta road; this hamlet typified the Yega trend away from large nucleated settlement to a farmstead pattern in which homes were dispersed on or near the main garden and cash crop areas.

245 423 In March 1964 a group of 23 Yega men, only one of whom had been allocated a cocoa block at Ononda, decided to clear another large tract of rain forest which would then be divided equally among the participants in the scheme. The site chosen for this new block-type development was Berojou near the south-west Yega/Beuru boundary. This boundary had been declared by the Land Titles Commissioner, surveyed, and marked by cement boundary posts. Though final siting arrangements for the individual blocks had not been completed it was expected that blocks would be approximately 10 chains frontage by 20 chains depth (frontages double those of the Ononda blocks).

245 423 614 602 The Berojou scheme differs in two major respects from the earlier Yega schemes at Ononda. Firstly it was sited on land over which certain clans, Jambapa and Kurou, had recognized rights of allocation and secondly all members of the group concerned in the development were members of these two clans or had close affinal ties with them. Men related to Jambapa were allocated blocks on Jambapa land while men related to Kurou were allocated blocks on Kurou land. These relationships illustrate the way in which rain forest was traditionally cleared by the Yega. A close affinal tie was usually essential before a person could be invited to join another group and clear rain forest belonging to another clan.[1]

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[1] Ten men in this group planted the land of other clans. In six cases their mothers were members of the clans on whose land they

245 Work on this scheme had not progressed far at the time of observa-
476 tion because of unseasonable weather. Underbrush and small trees had
been cut by each individual on his block but it was decided to wait
for dry weather before cutting the big trees by communal effort.
All Yega would then be invited to help and helpers would be recompensed after the clearing of each block by a feast given by the
blockholder and his family.

245 As with the Yega Scheme, the advice and help of Agricultural
(242) Extension Service officers was requested and given. The site was
inspected and soil suitability evaluated before the Yega started
[484] clearing. However, although the layout of the Berojou blocks
closely resembled the Ononda blocks, they are half an hour's walk
[489] along narrow footpaths from the Gona-Popondetta road, the only
vehicular road in the area.

245 The people concerned in the scheme lived in various places.
361 Most lived in the Konje area, one at Mumburada, one at Gatara,
166 while eight lived in Beporo and one further away at Gombe. However, it was likely that the Beporo and Gombe people would move
inland in the near future. There was at the time no talk of moving
home sites to the new cocoa blocks at Berojou.

Conclusions

241 The clearing of rain forest for planting blocks with permanent
245 tree crops whose produce was to be sold for cash was a radical
178 departure from traditional Yega land usage. The Yega Scheme in-
423 corporated traditional principles of land tenure and work
organization with modifications to meet the changed circumstances
of today. Features deriving from traditional precedents were:

[476] [464] (i) the use of communal labour to clear the forest, and the subdivision of the cleared area among those who helped in the work;

(ii) the absence of any documentary record of the transference of rights to individual right holders (although this was later provided under new legislation);

[464] (iii) the organization of group labour for certain tasks even though recruitment of members might not necessarily be based on purely traditional criteria;

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245 (continued)
423 planted, in one case the wife was, in one case the father's sister's
219 husband, in another the half-brother by a different father and in
602 the last case, the father of a half-brother.

241 245 178 [423] (iv) the strong desire of individual members of extended families each to have personal control of a piece of land and of useful trees on that land.

The aspects which had little precedent in traditional custom were

(i) the systematic layout of blocks;

[433] (ii) the production of crops for sale;

[242] (iii) the supervision and guidance of Agricultural Extension officers and workers, most of whom had no kinship ties with the Yega;

[361] (iv) the provision for the location of a blockholder's dwelling on the block itself rather than in a village.

The value of the Yega Scheme is this combination of old and new which was achieved by basing the scheme on traditional precedents in so far as they were appropriate and incorporating innovations where necessary. The main innovations were organizational and technological - involving new crops, new husbandry techniques, new 241 245 178 464 processing methods and equipment. There was an increase in some forms of group activity, for example bush clearing by all the Yega (whereas bush clearing was traditionally carried out by sub-clan groups), and the proposed co-operative fermentary and marketing facilities. On the other hand, a greater dispersal of residence and the adoption of new mores were responsible for some diminution of traditional forms of group activity. In pre-contact times the family was the basic unit for garden work but larger groups formed for other activities. With the addition of cash crops, agricultural work took more time and many of the larger groups for fishing and social activities atrophied.

241 245 178 423 The rights of the individual in cash cropping land will become more marked in relation to those of the sub-clan and tribe. Whereas food gardens were held by individuals or small descent groups and rights at this level were flexible due to rapid demographic changes and the system of land rotation, cocoa is a relatively permanent crop and the planter is associated all his life with the land on which the trees are planted. With change in the legal status of the land the rights of the social group to the cash crop lands are certain to diminish in favour of individual rights.

361 178 The new pattern of residence, showing tendencies towards 'ribbon' development and particularly towards the dispersal of homesteads, varied markedly from the traditional form. Most significant of all variations from tradition was the location of homesteads by individuals on potential extensions to their cocoa blocks. With [423] the registration of individual title to these lands it seems likely that this trend will continue. If the trend towards dispersion

Introduction

474 Since the end of World War II there has been a rapid development
178 of co-operative marketing and retailing and in some cases
production amongst the indigenous people of Papua.

[121] This paper describes the origin of the co-operative movement
in the Northern District and its subsequent development and
[797] modification particularly as applied to Yega.[1] The Yega were one
of the first groups to organize a producers' co-operative, under
the guidance of the local Anglican Mission. The movement rapidly
extended to other groups of Orokaiva.

The development of agricultural co-operatives

474 As early as 1940 the Reverend James Benson of the Anglican
Mission at Gona had begun to preach the virtues of co-operation.
797 Benson was imprisoned by the Japanese but returned to Gona in
177 1946. The first mention of any co-operative in the district
comes as a brief entry in his diary on 6 October 1946, 'Foundation
● 241 of Gona Public Trust' (G.P.T.). The functions of the G.P.T. are
not clear beyond the fact that it was organized as a committee or
board - entirely Papuan in composition, with Father Benson as
advisor - aimed at investigating ways and means of improving
474 standards of living.

241 One of the most dynamic and influential members of the G.P.T.
committee was Samuel Ungega from Gombe village. He was a member

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128 [1] Acknowledgment is made to the following people who read this paper in draft and offered helpful criticism:

H.H. Jackman, Esq., Chief of Division (Business Training and Management), Department of Trade and Industry, Papua and New Guinea, formerly Registrar of Co-operative Societies (1960-2);
G. Morris, Esq., Kokopo, T.P.N.G., formerly Registrar of Co-operative Societies (1956-60);
Rev. J.L. Wardman, Mt Hawthorn, Western Australia, formerly Anglican missionary in charge at Gona (1953-61).

474 of Orewo lineage of the Kurou clan of Yega, who had been educated
to Standard IV at Gona Mission School and had spent the year before
● 241 the war working at Bunting's store at Cape Killerton. Just prior
to the war he joined the Papuan Infantry Battalion and became a
corporal. During the war an Australian soldier with whom he was
friendly convinced him of the possibility of raising money from
short-term crops. The Administration had introduced copra-making
much earlier, but prices were low and there was little enthusiasm
for the crop.

Even before the formation of the G.P.T., Samuel had convinced most of the Yega of the desirability of co-operative farming. Subscriptions were called for: money was available from war damage compensation and most Yega households subscribed from $10 to $20, each person contributing as much as he wished.

Clearing bush for the co-operative gardens was begun at four sites in mature rain forest at Ononda, Garara, Mumburada and Ingaba-Betari. Little information was available on the subsequent operations at Mumburada and Ingaba-Betari but some details were obtained for the Ononda and Garara projects.

Samuel placed an ex-serviceman comrade in charge at Ononda. A
site was selected by Nixon Kairembora, the Yega 'land custodian',
[628] between Ononda and Epa Creeks.[1] Meanwhile some of the neighbouring
Beuru and Ahora people obtained Samuel's consent to join the Yega
in their co-operative efforts, paid him money and were permitted
by him to assist with the clearing of bush at Ononda.[2]

Crops were planted at Ononda by co-operative effort for two
[439] years. The man in charge says that good crops of peanuts were
grown and sold to the Administration, being taken by headload to
[454] the coast, thence by canoe to Cape Killerton. The money from the
sale of these crops was paid to Samuel Ungega who banked it at
Higaturu. Unfortunately, no records of the amounts obtained are
now available.[3] Large quantities of sweet potatoes were also

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[1] For the history of this land see pages 30 and 48 and Fig.7 of the previous article.

[423] [2] When asked whether the fact that the Ahora and Beuru had cleared
[464] bush at Ononda would strengthen their claims to the land the Yega
replied in the negative. They stated that non-Yega were employed
only in the capacity of workmen: they were paid in produce at the
time and had no further rights.

[768] [3] One of Samuel's brothers, who was a young boy at the time of
Samuel's death in the Mt Lamington eruption, said he remembered
numbers of Samuel's books being burned and thrown away in the bush
when relatives went through his belongings.

474 grown. These were mainly used as food by the co-operative workers,
241 but in times of local food shortage they were sold to other vil-
lagers. All workers, Yega, Ahora and Beuru, lived in garden
[438] houses on the Ononda garden site during the week and returned to
[484] their home villages only at week-ends.

The establishment of gardens and the work organization were similar at Garara. There also, peanuts and sweet potatoes were the main crops. According to an informant the value of the first harvest in 1947 was $190.

[797] Unfortunately for the co-operatives, the mission organizers soon disagreed with Samuel, for the Rev. Benson's diary on 1 April 1947 speaks of him as a 'wife-deserter, and who in consequence has been put off the committee of the G.P.T.' (and presumably placed under Church discipline). It was also stated by informants that there was dissatisfaction among shareholders with Samuel's rather secretive management of the money.

At this point the G.P.T. ceased to function and the co-operative
efforts of the Yega proceeded in different directions. The Anglican
[797] Mission sponsored a Christian co-operative which became known as
[614] the Gona Co-operative Society, while Samuel Ungega organized the
Gombe Co-operative. He was supported by most members of his own clan (Kurou), some members of his new wife's clan (Jambapa), a few members of other Yega clans (Seseko and Konambo) and also by five members of the neighbouring Bapa sub-tribe. Four of the Bapa men were married to women of Kurou Dunemba sub-clan which joined the Bapa people in past times but with whom Yega Kurou still maintained exogamous relations. The fifth man was a brother of one of these four, having no direct affinal link with Samuel or other members of Kurou clan.

[657] Early in 1948 the foreman in charge at Ononda was sent by the mission authorities to Boreo to instruct people in co-operative techniques. At about the same time the Ahora and Beuru labourers were forced by the Administration to return to their villages because of labour problems at home. Samuel's Gombe Co-operative then abandoned farming at Ononda and restricted its operations to the Garara site, where all land rights were held by members of the Jambapa clan, the clan of Samuel's wife.

[484] All members of the Gombe Co-operative workforce, including the Bapa men, lived in garden houses on the Garara site from Monday to Friday each week. The Jabapa landholders permitted the members of other clans and the Bapa men to use nearby secondary forest for their food gardens. This saved travelling time and permitted the maximum time to be spent on the co-operative gardens.

The Gombe Co-operative continued operations during 1948-9 but because of opposition from the mission it never gained popular

474 support, a peak number of 19 households being engaged during 1949.
241 In 1950-1 Samuel attended a nine months training course in Port
Moresby at the invitation of the Administration Co-operative
Officer. Samuel attempted to ensure the continuity of his scheme
by appointing and training three men to oversee operations during
his absence. Two of the men chosen were Yega men with close affinal
ties with Samuel, the third was a Bapa man having only a remote
kinship link but particular ability. The scheme continued to function
smoothly during 1950. Samuel's plan was to grow annual cash
crops and to build up a reserve fund for the first few years, then
to undertake tree-cropping. He bought cocoa pods and had the seeds
planted in a nursery in January 1951. During his training period
Samuel made two trips to Gona to observe the progress of the co-
[731] operative. On the second of these visits he took his daughter to
the hospital at Higaturu and was among the 4000 killed when
Mt Lamington erupted on 21 January. After his death no more cash
crops were planted at Garara. No one knows what became of the
money received but none was ever distributed to members of the
Gombe Co-operative.

474 The mission-sponsored Christian co-operative embraced more
241 people and a much greater area than the Gombe Co-operative. The
177 Anglican Mission at Gona is responsible for an area that stretches
797 approximately 30 miles north and 15 miles south and extends in a
rough arc 5 to 10 miles inland. Little information was available
from the mission records, but it seemed likely that the Christian
co-operative, named the Gona Co-operative Society, was launched
during April or May 1947, that membership among the Yega was almost
universal (apart from the members of the Gombe Co-operative) and
that there was no fixed share payment, each adult male contributing
what he could afford. A large store was built.

[657] In September 1947 Mr John Millar, government officer in charge
of co-operative development in the Territory, visited Gona and
addressed a meeting of 500 people in the new store, explaining
the Administration's plans for co-operatives in the area. He
suggested that the present Gona Co-operative Society be split into
an association of eight smaller societies, each centred in its own
local community.[1] The meeting agreed and Mr Millar departed. The
committee assumed that theirs would be among the first co-operatives
to be registered when the necessary legislation had been passed and
this was the position when Father Benson departed on home leave at
the beginning of December 1947.

Mr Millar's advice was implemented after April 1948 by Rev.
Alfred Clint who undertook to organize and co-ordinate the

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[1] The eight societies within the association were to be centred at Gona, Garará, Bakubari, Gombe, Soputa, Buna, Huhuru and Hamburata.

474 development of each of the small local co-operatives. These were
241 all organized along similar lines but the following description
applies specifically to the Gombe Co-operative which (to distin-
[177] guish it from Samuel Ungega's venture) was renamed the Yega
[797] Co-operative.

The executive committee of the co-operative consisted of five members: a chairman who was a well-known elder and later became the acknowledged leader of the Yega, a secretary who was a younger man of some education and in good standing with the mission authorities, and three young and energetic members, two of them ex-servicemen who had had some post-war agricultural training at
[666] Dogura. This committee was elected by a general meeting of Yega
people. Its function was to decide which land to use, when to
[857] change areas of cultivation and when to work: co-operative work days were Tuesdays and Saturdays when all people (even school children on Saturdays) were supposed to work on the co-operative gardens. At certain times, such as harvesting, extra work was necessary. The committee made the decision when to call for such extra efforts. In addition, the committee appointed people to other set duties and supervised the performance of these duties. Such positions were:

i. jobmaster, who allocated work;

[451] ii. farm leaders, who kept farm records,[1] supervised sowing, harvesting and other technical aspects - these men had all had some agricultural training;

[407] iii. huller operator. A rice huller was acquired and installed at the western end of Beporo village;

[461] iv. toolkeepers and timekeepers. They kept tools in good repair, and rang the bell at 8 a.m. for staring work, at mid-day for prayers and at 5 p.m. for knocking off and prayers. Although people then lived in villages stretching along about three miles of coastline, and the only bell was in Beporo village, it was stated that in the early days of co-operative work most people were punctual; after the first year there was a gradual slackening in enthusiasm.

[451] The secretary kept a roll book in which the names of all workers were entered. Each work day he walked round the gardens and ticked off the names of those present. There was no attempt to discriminate between hard workers and slackers. The person who worked for one hour received the same credit for attendance as one who

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[1] Unfortunately no written records of the co-operative were located.

474 worked for eight. This became an important basis for resentment
and discontent among the workers.
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The arrival of Rev. Clint in 1948 ushered in a period of
dynamic growth in the co-operative movement in the district. He
474 had a deep interest in co-operatives, and had been associated in
241 Australia with the Christian Socialist Movement. He was speci-
177 fically recruited by the mission to organize agricultural
co-operatives and within three weeks of his arrival he had held
797 meetings with the members of three of the co-operatives and had
discussed future development with the District Agricultural
[657] Officer, Mr Cockshott. In mid-May he commenced a weekly co-
operatives instruction class covering co-operative leadership,
[191] history of co-operatives, basic techniques, book-keeping and
English.

[782] Rev. Clint was insistent that Christian ritual be associated
with co-operative action. Educational and committee meetings
always closed with a special prayer, there were church services
at which tools were blessed and newly planted seed was blessed
[795] in the gardens. This aspect of the co-operative movement was
regarded with some apprehension by Administration officers who
[178] felt that it could be misunderstood by the Papuans and possibly
lead to the development of a cargo cult. There was some evidence to suggest that a cult did in fact begin. Money was collected surreptitiously (its disposal was never explained), and in the opinions of some observers there was a belief among some participants that the mere formation of co-operatives and the routine performance of the work required would magically raise the Papuans in a short time to the status of Europeans. On the other hand, there was evidence to support the view that the people in their desire to improve their economic position saw co-operatives as the channel and adopted the idea wholeheartedly. There is something of both these views in the statement of the ex-chairman, who said: 'We wanted to be like other civilized countries and earn money by working together.'

In November 1948 there were 25 acres under dry rice at Gona No.1, and 10 acres under taro, 6 acres of rice and one acre of peanuts at Gona No.2. Similar areas were under crop at the other co-operatives. The first harvest in early 1949 appears to have been a success. On his return from leave in March 1949, Rev. Benson spoke of 'barns and storehouses bursting with rice, people happily busy...true comradeship and Christian co-operation'.

474 In August 1949 the first four co-operatives in the Territory
241 were registered.[1] They were, in order: Yega, Gona, Garara and

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657 [1] This registration was made under the terms of draft legislation. It was not confirmed by the Registrar of Co-operatives under the finally approved legislation, the Co-operative Societies Ordinance 1950.

474 Buna. The registering officer stated that 'the co-operative move-
241 ment in this district is the only one yet far enough advanced for
651 registration'.[1]

About this time, discussions were held between Rev. Clint and
the local agricultural officers regarding the practicability of
474 planting tree crops - especially coffee and cocoa - as eventual
241 replacements for the annual crops then being grown. The problems
associated with the establishment of these tree crops were not
177 solved, however.[2] Had they been solved, a serious difference of
[797] opinion regarding policy would have been avoided. The divergence
of views was between Rev. Clint, who saw the production of rice
by co-operative methods mainly as a way of improving the subsistence diet of the people, and the people themselves, who saw it as a way of earning money. As time went on, it appeared to the villagers that Rev. Clint's interests lay only in subsistence crops and their enthusiasm began to wane. Towards the end of 1949 Rev. Clint became ill and he had to return permanently to Australia in January 1950.

474 In Rev. Clint's view Christian co-operatives had 'grown naturally
241 out of the teachings of the Christian faith' (Clint 1950). Unfor-
177 tunately he did not recognize that material considerations weighed
at least as heavily as spiritual values in the minds of the people
433 among whom he was working. The people had readily accepted a
departure from the traditional practices of land tenure, an entirely different system of work organization; and the cultivation of a new crop, rice, which involved radical changes in their gardening techniques. The Yega, anticipating a substantial cash income, had welcomed these changes, but soon discovered that rice could not be converted readily to cash. There was no possibility of rice being grown in sufficient quantity in any one locality (for reasons of land availability and manpower) to justify the establishment of central milling facilities, and inadequate transport facilities prevented combination with other areas, even had these existed at that time. Without central milling, which would have produced a brown rice, properly dried, and saleable to the Administration and plantations, the only means of converting 'paddy' rice into a storable product was to use smaller semi-portable mills to produce
243 white or polished rice. The milling, however, whilst converting

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[1] Quoted in the Gona Anglican Mission Diary.

[2] Specifically, lack of knowledge of the soils in the area, lack of any experimental plantings, and a shortage of trained staff.

243 'paddy' to food, prevented the conversion of the food to cash,[1]
[262] though it was quite suitable for village consumption as a supple-
mentary food. In fact, imported white rice has now become an
important 'status' food at feasts.

474 Rice continued to be grown for about a year after Rev. Clint's
241 departure; small quantities were sold by the cupful but the income
received would have been negligible. In 1951 the crop was attacked
[242] by a species of 'army worm' and on the recommendation of the
District Agricultural Officer was destroyed. No further plantings
were made and all co-operative agricultural activity lapsed.

By 1952 co-operative agricultural activity had ceased among the Yega. The death of Samuel Ungega (the only man in the co-operative who had any training in co-operative work and the only man capable of directing activities on a long-term basis), removed from the Gombe co-operative the main driving force.

[177] The basic reason for the failure of the Christian co-operative seems to have been that Rev. Clint's aim was to produce a storable food crop whereas the Yega wanted a cash crop. The scheme was established on an inadequate business basis and with insufficient understanding of the people's deep-seated desires.

The modern co-operative and the extent of Yega participation

474 A subsequent co-operative, organized by the Administration and
[241] known as the Gona Villages Native Society Limited, came into being
in May 1953. In that month share capital amounting to $2542 was
repaid by the Administration to 332 members of the old Gona, Gombe
(Iaga) and Garara co-operatives, most of whom immediately became
shareholders, at a uniform $10 per share, in the new society.
The new co-operative was to serve different purposes from the
earlier ventures. There was to be no attempt whatever at communal
[443] production. Functions were to provide marketing facilities for
the agricultural produce of individual members and to conduct a
retail trading store.

[347] Operations were begun in a store previously owned by A.H. Bunting Ltd on the Popondetta-Killerton Road, half a mile from Cape Killerton. Originally built from local materials and with a tin

[TEXT CONTINUED ON PAGE 64]

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[657] [1] Only brown unpolished rice is issued as rations to the Administration and plantation labour. The endosperm and much of the vitamin content are removed in the production of white rice, so that employers issuing white rice would have to supply additional vitamins, an uneconomic proposition.

474 347 roof, the store had to be rebuilt by the co-operative in 1954, on a site adjacent to the original one; it was replaced by a permanent building, constructed on a new site only 100 yards from the wharf at Cape Killerton.

474 443 [241] [242] Marketing was of minor importance for the first ten years of the store's operation. Although there were numerous coconut palms in the shareholders' villages, the subsistence demands on them were heavy. Very little copra was offered for sale at the store before 1962 but production increased following a renewed emphasis on the crop by the Department of Agriculture's Extension Service. Copra turnover increased from nil in 1961-2 to $254 in 1962-3 and $1104 in 1963-4. There were at the time of this study few other cash crops in production but labour was an important source of cash.[1]

By contrast the store's retail function was rapidly established. It was for 11 years under the competent control of its first appointed manager, Mr Hankin Kombega, a local Yega man who was also secretary of the society. Within two and a half years from the start of retail trading, a net profit of over $2000 was disbursed to shareholders at the rate of $0.25 for every $2 spent. Only two other rebates were paid - in November 1960 and December 1962; the rebate which would normally have been paid about the end of 1957 or early 1958 was diverted to the construction of the new store. The average rebate paid to shareholders in December 1962 was approximately $3 per head and for Yega shareholders the average was $5.10 per head. Although these amounts may sound small, it should be borne in mind that the share basis was only $10 per head. In addition, the rate of rebate (in 1964, $0.10 per $1) was much [438] higher than that paid by co-operative societies in Australia. The inducement offered by the rebate system did influence Yega purchasers in their choice of a retail store. Of a sample group of eight men questioned, two claimed that all their purchases were made at the co-operative store, four others estimated that over half their purchases were made there, one estimated less than half and one was uncertain.

The Gona Villages Native Society Ltd was managed by a chairman, secretary and board of nine directors, all Papuans, elected by the shareholders. The board met each month and its minutes were sent to the Co-operatives Inspector in Popondetta for approval or veto. If decisions were vetoed, adequate explanation was given.[2]

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[1] See p.65.

[435] [2] An example was the rejection of a board decision to increase the purchase price of copra from 3½ d. to 4 d. per lb. Detailed costs were calculated to show the board that at 4 d. (3 cents) per lb. they would make too small a profit margin.

FOREWORD

101 In the central part of the Northern District of Papua there is a concentration of approximately 26,000 people who are [619] known collectively as the Orokaiva. The term Orokaiva came into use some years after European contact, and before that time the Orokaiva did not recognize themselves as a single group, nor did they all interact for any common purpose. Although they do not claim common ancestry, the various sub-groups possess a relatively homogeneous cultural heritage. The Orokaiva speak several dialects which are mutually intelligible and belong to a common language.(1)

241 During the last ten years there has been considerable development of commercial agriculture within the area. Many 241 people have planted cash crops on land held under customary 423 tenure; some villages have planted communal blocks on land set 657 aside by the rightholding clans; the Higaturu Local Government Council (which serves most of the southern part of the Orokaiva culture area) has instituted a scheme for the allocation of cash crop lands to individuals, and for the registration of the land with the Council; some Orokaiva have taken up agricultural leases of small, family holdings on government land, and they are provided with capital, extension services and registered land titles; others again have entered the plantation economy (none as entrepreneurs as yet, but many as workers on European plantations in the area); and at Beporo (on the coast) the people have embarked on a new experiment involving the cutting of clan land into rectangular blocks, allocation by ballot, and the planting of cash crops by families.

121 The aim of the Unit's research is to determine which of these systems has been or promises to be most productive (in the economic sense) per man, per unit of capital and per acre of land; which of them is best suited to the introduction of

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(1) The term Orokaiva has no precise connotation but is here used in its widest sense to include such culturally related groups as the Notu, Binandere, Aiga and Sangara. The word is often used in a more restricted sense to refer to those people (predominantly speakers of the Kombe-Sangara dialects) who are served by the Higaturu Local Government Council.

134 regrowth. They are lower lying than the surrounding savannah and are poorly drained.

(ii) The Girua Association consists of coarse textured, recent riverine deposits covered with forest or regrowth. It lies beside the Sambogo and Girua rivers. The association covers about one fifth of the Inonda lands and, being permanently moist and apparently fertile, these soils are extensively used for food [829] gardening. The local people have given this soil type the name tumene.

(iii) The Warisota Association occurs on the lower slopes of the valleys of the Hydrographers Range, where the Sambogo river and its tributaries emerge from the foothills. The soils are recent, well drained, medium textured clay loams, becoming fine textured with depth, and being grey to grey-brown in [137] colour. They are covered with a heavy forest or secondary growth vegetation, but there is little accumulation of organic matter in the topsoil.

[241] These soils, which cover approximately one fifth of the Inonda lands, are used for food gardens, although they are not favoured because of their tendency to dry out during the dry [829] season. On the higher ground they are known to the Orokaiva as hora while on the lower ground they are known as hohori. The hohori runs into the still lower lying tumene of the Girua Association.

(iv) The Hydrographer Association lies in the deeply dis- [137] sected foothills of the Hydrographers Range. The soils of this association are shallow, stony and poorly differentiated, carrying a hill-type rain forest. They are not favoured for gardening and the people use this land only for foraging and hunting. Its agricultural potential has been assessed as "negligible"(1), as both topography and soils are unfavourable for the growth of crops. It occupies approximately one fifth of the total area of the Inonda land.

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(1) Ibid, page 26.

134 [197] (v) The Avalanche Association consists of riverine deposits of gravel and boulders interbedded with sheets of sand, lying on the floor of the Girua river. It occupies a very small proportion of the Inonda lands, supports a kunai vegetation, and appears to have no potential for either agriculture or forestry.

132 Climate: The climate is hot and moist, except for a hot, relatively dry season which lasts from about July to September. Because of the influence of the Owen Stanley Ranges there is a rapid west-east decline in rainfall over the Orokaiva area. Popondetta has an average annual rainfall of 96 inches so that Inonda, lying 5 miles to the east, probably has a rainfall of 80 to 90 inches. The yearly pattern of rainfall distribution, which is very similar for both Inonda and Popondetta, can be seen from the rainfall recordings for Popondetta given in Appendix C A (1)

805 824 The Inonda people refer to the dry season as huvira because the huvira tree (Erythrina indica) flowers at that time. The wet season is divided into a number of periods which are recognized by the ripening of various nuts (especially hauga) and edible pit-pit (ina), and by the flowering of the garepa tree. For instance, the garepa season begins about November or December and lasts for two or three months. These are the wettest months of the year and plant growth is therefore rapid at that time. The pasiro (a variety of pit-pit) ripens about [574] March, which is a time of more moderate rainfall. Food is in abundance at this period, and it is accordingly the most popular season for feasting.

132 241 The warm moist climate is generally favourable for plant growth, but because many of the soils are coarse in texture and have low water-holding capacity, even short periods of drought may adversely affect the growth of shallow rooting crops (including the staple food, taro). Deep rooting crops such as coffee, cocoa and coconuts are less affected by the dry periods.

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(1) This average was computed from recordings taken over the 7 year period 1955-61.

A [See Category 132, p. 100--Analyst]

Land use

241 **Food gardening:** The people have been able to select the best land for cultivation, avoiding the rugged hillsides with their infertile stony soils and the kunai grasslands which are difficult to clear. The soils which they use for gardening are sufficiently fertile to give satisfactory food production without the application of artificial fertilizer. Yields are maintained by a system of bush fallowing, whereby the land is cropped once, and then left to revert naturally to regrowth for a period of approximately eight to fifteen years. There is no evidence of soil erosion or decline of soil fertility under this system and if land were in short supply the average period of fallow could probably be shortened considerably without reducing fertility. However, if a shorter fallow period was adopted, pests and diseases would probably multiply thereby causing a decline in crop yields. Moreover, short rotations enable kunai grass to become established, and this makes cultivation more difficult, as kunai is almost impossible to eradicate.

Clearing the virgin forest(1) in preparation for gardening presents considerable difficulty. However clearing the regrowth for subsequent gardens is very much simpler, and this [412] is the more common pattern. Axes and bushknives are used to clear the vegetation in preparation for planting the food crops. The dry season is the most suitable time for this operation as the felled vegetation dries quickly and is easily burned, but clearing is carried on at all times of the year. After the bush [412] is cleared, the dead timber is stacked and burned. The food crops are then planted with the aid of a digging stick. The garden is usually weeded two or three times before the crops are harvested.

Approximately ninety per cent of the land cleared is planted with the principal crop, taro (Colocasia sp.) of which at least nine varieties are grown. These varieties differ in the length of time required to mature and in resistance to drought. Though some planting takes place throughout the year, most of it is done in three periods, namely August-September (the end

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(1) What is regarded as virgin forest may well have been cropped many years ago, but if so the fact has long since been forgotten by the present inhabitants.

241 of the dry season), November-December and March-April. A little Xanthosoma sp. (Chinese or giant taro) is planted as it is more resistant to dry conditions and therefore acts as a reserve against drought.

Most households(1) grow some sweet potato, planted either as a pure stand or amongst taro. In the latter case it is usually planted at the same time as the taro, but occasionally it is planted as a second crop after the taro has been harvested. This, however, is not the normal practice and yields from vines grown in this way seem to be low.

Other food plants are scattered throughout the taro and sweet potatoes and include corn, bananas, sugar, various kinds of ina (edible pit-pit), yams, manioc, pineapples, cucurbits, tomatoes, beans and shallots. Table 1 shows the average area or number of these plants (in all stages of growth) per household at the time of the survey.

Table 1.

Food plants per household (8 households)

Crop	Average	Range
Taro (Colocasia sp.)(2)	1.3 acs.	2.6 - 0.4 acs.
Sweet potato(2)	0.2 acs.	0.4 - 0 acs.
Bananas	81 trees	145 - 12 trees
Sugar	71 clumps	167 - 34 clumps
Ina	56 clumps	181 - 4 clumps
Yams	24 vines	61 - 0 vines
Manioc	10 plants	27 - 4 plants
Taro (Xanthosoma sp.)	5 plants	25 - 0 plants
Corn	72 plants	140 - 0 plants
Pineapples	1 plant	7 - 0 plants
Cucurbits	2 vines	10 - 0 vines
Shallots	a few	
Beans	a few	
Tomatoes	a few	

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(1) Details of household composition are given on page 16.A

(2) Areas covered by taro and sweet potatoes were calculated from an estimate of the percentage of the total area of the garden covered by each of these two crops.

A [See Category 614, p. 16 ff.--Analyst]

241 The supplementary food plants provide both variety in the diet and some insurance against failure of either of the two main crops. Corn matures within two or three months and can be planted amongst the taro if a food shortage appears to be imminent. [262] Both wild and cultivated sago is used as an emergency food. There is usually a shortage of garden crops at the end of the dry season, and this is overcome by making sago. Sago is only eaten at other times when large quantities of food are needed for feasts.

The boundary of a food garden remains recognizable for about three years from the time of clearing. By then the garden is covered with either regrowth or kunai and is no longer 126 producing food. All food gardens with recognizable boundaries were surveyed by chain and compass and the area of each garden calculated.(1) The date on which the vegetation had been cleared for the preparation of each garden was determined as nearly 241 as possible. The average area of land required for food gardens for the village as a whole was found to be 12.76 acres or 0.27 acres per head of population per year.(2) Areas of subsistence gardens at present being cultivated or from which food is currently being harvested are summarized in Table 2.

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(1) Maps on a scale of one inch to one hundred feet were drawn. These have been reduced photographically and are reproduced on pages 106-108.[A]

[128] (2) This figure was calculated by the following method. For each household, areas of all gardens with recognizable boundaries were determined and totalled. The date at which the oldest of these gardens was established was determined for each household. From this information the area of garden land required per month was established for each household. (For example if the total area of gardens made by a household over 27 months is 5.4 acres, then that household makes new gardens at the rate of 0.20 acres per month or 2.40 acres per year.) The area of new garden land brought under cultivation each month by the village as a whole was then calculated by totalling the area required per month by each household, and multiplied by 12 to give the area required per year. This figure divided by the population of the village, gave the area of land required for gardening per head of population per year. The area of 0.27 acres of garden land per head of population per year should not be confused with the area of land which people were cultivating at the time of the survey. This latter area (0.31 acres) includes land cleared but not planted, land planted with gardens not in production and land from which garden produce was being harvested at the time the survey was made. It does not relate to any period of time, but gives an indication of the area of land which the households were actually tending at that particular time.

A [See Category 102, pp. 106-108--Analyst]

Table 2.

Garden areas now under cultivation

	Area per head of population	Area per able-bodied person (over 16)	Area per household
Garden currently producing	0.19 acres	0.41 acres	0.90 acres
Gardens planted not yet producing	0.08 acres	0.18 acres	0.38 acres
Garden cleared yet to be planted	0.04 acres	0.08 acres	0.19 acres
Total area of garden under cultivation	0.31 acres	0.67 acres	1.47 acres

It is difficult to establish the length of the bush fallow-food garden rotation, but the majority of the gardens measured had previously been planted between 1951 and 1954 by the refugees of the Mt. Lamington eruption who settled in Inonda for several years. The Inonda folk began to plant these areas about eight to nine years after their previous use. This, they say, is shorter than the normal fallow, but crop yields from these gardens were apparently normal, which suggests that the rotation can operate satisfactorily on a cycle of eight years, though it is often considerably longer. If it is assumed that a piece of land may be planted once in every ten years, then with the present system of food gardening the Inonda people require 127 acres of land to maintain their present level of subsistence from garden crops. There is thus no pressure on land resources, for the Inonda lands(1) cover an estimated total area of 2,900 acres (excluding the Sambogo land). Of this total area perhaps one fifth or 580 acres is good gardening land and much of the remainder could be used for agricultural production if the need arose.

At present most of the food gardens are located

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(1) As delineated on map on page 105.[A]

A [See Category 102, p. 105--Analyst]

241 about one and a half miles (thirty-five minutes walk) from the village on part of the land known as Inota. They are planted contiguously: partly to keep the amount of clearing and pig fencing to a minimum and partly to ensure companionship while working in the garden (which may be related to the traditional but now unnecessary consideration of mutual protection). Because of this practice and for other reasons enumerated below many people have made their gardens on land in which their lineage has no proprietary rights. Each household has at least one garden which is currently producing and one recently planted but not yet in bearing on the Inota block. Three of the households have gardens (or are in the process of making gardens) on other Inonda lands (Eumo and Sesehauta) while three other households have made or are making gardens on land at Hohota village. Two of the latter are new gardens and they are situated about one mile from Inonda and the other, which is currently producing, lies west of Hohota village about 4½ miles from Inonda. Two other gardens made by Inonda people on Hohota lands in 1960 have now been abandoned.

The people say that in earlier times they made special feast gardens to provide food for taro festivals, death [621] feasts and other occasions. Feast gardens were often cleared on a community basis by all the working members of either the village or a sub-clan within it, but were then subdivided and a section was allotted to each of the households for cultivation. [574] The Administration has discouraged large scale taro festivals and none has been held for several years. However when a man from the village died during the survey, the members of his family decided to make a feast garden on a piece of ground which he had cleared just before his death.

We were shown two feast gardens, one made in 1953, and the other in 1960. The precise boundaries of the one made in 1953 are no longer recognizable, but the garden was apparently [574] a very large one of five acres or more. It was made to provide food for a feast held when refugees (from the Mt. Lamington disaster) from Sewa and Ajoro villages left Inonda to return home. The other feast garden, which is now abandoned, was made at Hohota by a man who has no hereditary rights in land at Inonda. He has three married daughters, two of them married

241 to Inonda men, and his three son-in-laws assisted him to make the garden, which covered an area of 2.32 acres.

241 417 Fencing: Wild pigs living in the nearby forest are always a menace to the food crops and the people erect fences and set traps to protect their gardens. The first panel of a fence is built where the people consider that pigs are most likely to enter the garden (usually the side facing the forest). Often, no further fencing is done until a pig enters the garden through an unfenced area. Then another panel may be built and this sequence is continued until the garden is almost pigproof. Natural barriers such as steep-sided creeks and large fallen trees are incorporated into the fences whenever possible. Households with neighbouring gardens often work at the same time (but independently) in order to reduce the amount of fencing required to surround the garden area.

[462] All members of the household help with fencing but most of the heavy work is done by men. Straight green saplings about two inches in diameter are cut into stakes six feet long and thrust into the ground in pairs about nine inches apart with two feet between pairs. Logs of up to six inches in diameter are then either brought from the garden where they have been stacked after clearing, or are cut from the forest. They are piled horizontally between the pairs of stakes to a height of four to five feet, and the stakes are lashed together with wagesi vine to hold the logs in place. The warm moist climate causes fences to decay rapidly but they usually remain effective for about a year, by which time all but the latest-maturing garden products have been harvested.

224 Hunting, fishing and foraging: Inonda is more fortunate than many Orokaiva villages in that it has few people and extensive hunting lands. In fact the greater part of the total land area is used only for hunting and foraging. During the first month of our stay, ten wild pigs were speared or shot - a considerable quantity for a village of eight households. In addition, birds, bandicoots and other game were killed. [411] One of the villagers owns a gun which he makes available to others and this has in all probability reduced the time spent in hunting and at the same time increased the product.

224 Snares and traps are set at strategic points to catch wild pigs. A snare consists of a wire noose attached to a sapling which is fastened under tension to a triggering device. Snares are usually concealed along paths in abandoned gardens. The traps are of two types: the pit-trap which is dug two to three feet deep along a path or near a hole in a fence and has old spear heads and sharpened hardwood stakes "planted" in the floor; and the jump-trap which consists of hardwood spikes set at an angle in the ground with the points facing a low "gate" in the fence, so that a pig which jumps the "gate" impales itself on the spikes.

226 There is some fishing in the local rivers throughout the year, but most fish are caught during the dry season when the rivers are low and the water is clear, and spearing is then

222 easy and profitable. The people forage for firewood, wild yams, bush cabbage, honey and other foods. Although these products may make an important contribution to diet, they seem to provide only a small proportion of the total volume of food consumed.

131 Boundaries: The external boundaries of the Inonda lands are known in detail where they follow or cross the Sambogo and Girua rivers, and where they cut the main road. Elsewhere the people recognize only general boundaries which follow hill-tops or other natural features. Within Inonda the Girua and Sambogo rivers and their tributary creeks form the most important boundaries and each area of land is known by some physical feature, frequently the name of the adjacent creek. On the southern side the land extends back into the mountains in some cases to include the whole watershed of the creeks which feed the Sambogo, and in others to meet the boundaries of the Mosou and Tandai'undi lands.

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423 Each of the lands framed by the creeks is divided between the lineages. Boundaries are marked by trees (especially hauga and poponda) and other natural features. The gardens of different families and of different individuals within families are marked, sometimes by rows of crotons, but more usually by continuous lines of dead saplings laid end to end between trees or stumps. Individual gardens are not named but are referred to by the name of the person who plants them.

429 be available to any villager if another abandons them and does
361 not intend to rebuild on that site. The people can, nevertheless, point out the sites of the houses of particular individuals in
[425] former villages and in some cases these are marked by coconut or other trees. It appears likely that the ideal Orokaiva pattern was to occupy a series of village sites in turn (following the rotation of garden sites) but the Inonda people have not been settled long enough in one area for the rotation to become established. The people today claim that individuals and lineages retain rights in economic trees growing on former village sites but that rights to the house-sites themselves have lapsed.

423 Garden land: There is considerable flexibility in the relationship between the planting of food gardens and the holding
241 of rights to land. Of the 55 gardens (covering 27.1 acres)
613 which were surveyed, only 20 (covering 9.8 acres) have been
614 planted on land held by the lineage of which the planter is a primary member. Twenty-eight gardens have been planted on land in which the planter belongs to a different lineage within the same sub-clan or village. Three gardens have been planted on land held by another lineage of the same clan but in a neighbouring village, and the remaining four have been planted by a man who has no hereditary rights in Inonda lands but whose daughters have married into the village, one into the leading lineage. Details are shown in Table 3. Permission to plant is granted on a reciprocal basis and where the planter does not belong to the rightholding lineage, it is tacitly understood that when the main block of gardens moves to his lineage's land, he will permit other members of the sub-clan or village to plant gardens there if they wish.

Two of the five gardens which have been planted on land outside the Inonda limits are on the land of the Andiriha sub-clan in Hohota village. The planter of both was a born member of an Andiriha lineage which is represented in both Hohota and Inonda. He shifted to Inonda many years ago and joined the Inonda branch of his lineage. It appears that the gardens have been made in order to maintain or emphasize his claims to the land. His adopted son, who belongs to a different lineage, has also cleared a patch of second growth in order to make a food garden on this land. Two other gardens (one a feast garden) have been planted on Andiriha land at Hohota by the man who has

[TEXT CONTINUED ON PAGE 35]

Table 3

Rights to food garden land

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Nature of planter's right in his garden land	No. of gardens	Area of gardens (acres)
1. Planter is a primary member of the rightholding lineage	20	9.8
2. Member of a different lineage but within the same sub-clan	18	8.3
3. Member of a different lineage and sub-clan within the same village	10	3.7
4. Member of a different lineage but within the same clan (though in another village - Hohota)	3	1.6
5. Permissive rights only (belongs to a clan which is not represented here, but lives in Inonda village)	2	1.1
6. Permissive rights only (as for 5, but gardens located in another village - Hohota)	2	2.6
Total	55	27.1

423 only permissive rights at Inonda or any nearby place. He has
241 been living at Inonda for some years on a temporary basis and
is dependent for gardening land on his relatives by marriage at
613 Inonda. He has also been loaned two pieces of gardening land at
614 Hohota, where he used to conduct a church school, and is
obliged to accept whatever land is made available to him. One
of his gardens in Hohota is planted on land held by his mother's
sister's husband's brother's son, and the other on the land of a
senior deacon of the Hohota church.

Two other gardens with recognizable boundaries have been made amongst the main block of gardens. One was made in 1960 by an Inonda man who has since died, and the other by a man of the Jegotumo lineage (of the Andiriha clan) who was born in Inonda but now lives in Hohota village. The sub-lineage to which he belongs has rights to at least two areas of Inonda land. It was presumably to affirm his rights that he made a garden on one of these lands, for he does most of his gardening in Hohota, where his lineage has ample land. Inonda folk say that his rights in the Inonda land will 'live' while he or his son work the land and 'visit' the village (i.e. take part in appropriate village activities such as church celebrations, taro festivals, weddings and funerals). If he did not work the land, they say, then his sons (who are still small children) would not be entitled to make use of it.

423 - Informants claimed that a man in need has the right
241 to make gardens on the land of the mother's brother though this
604 is exercised only if it is within walking distance of the planter's
village. The only instance noted was that of a man who began
preparing a new garden on his mother's brother's land at Urio
just after our survey was completed.

423 Hunting and foraging rights: Any primary member
614 of the Andiriha and Jego'undi sub-clans in Inonda can hunt or
forage on any portion of the Inonda land which is covered with
621 virgin bush, kunai grass, or second growth. Likewise any
224 villager may take such timber or firewood as he needs from the
[313] virgin bush, and although it is said that one may also take these

226 423 Only three Inonda men exercise fishing rights outside Inonda. The first two are members of the Jego'undi subclan who were given rights to fish in the Sambogo river from Ere creek to Mosou village by their mother's brother along with the hunting rights already described. The part of the river concerned is adjacent to the part held by the Andiriha sub-clan. As Mosou village is situated close to the Jego'undi portion of the river, some Mosou men who have distant kinship connections with the Jego'undi are permitted to fish there. All parties confirm that no payment is made for this privilege but we have observed that the Mosou people make gifts of betel nut and sago to the Jego'undi. The Inonda councillor was given exclusive rights to fish part of the Sambogo river (adjacent to the Andiriha part but at the other end from that held by the Jego'undi) along with hunting rights to the surrounding lands.

241 Cash crops: Only small areas of land are being used for cash cropping (see map page 109[A]). In 1955 three households planted a total of 801 trees on 1.85 acres of land situated near the Girua river on Hohota lands and these trees are now in production. 241 423 They are planted on land to which the planters previously held only permissive rights of occupancy, although since 1961 these rights have been strengthened by registration under the Higaturu Local Government Council land registration scheme (which is explained in Appendix A). The problems associated with this land are discussed on pages 72-75. In 1961 another man planted 0.41 acres of cocoa on Inonda land in which another lineage has prior rights, but this will not produce for some years yet. A fifth man has staked out 0.6 acres of land at Inonda which belongs to a lineage other than his own, but because of the resultant dispute he will probably not plant coffee on it as originally intended (for details see page 75).

245 The small amount of coffee produced is sold in the parchment stage. If it is assumed that each tree will produce half a pound of parchment coffee annually then total production for the village will be approximately 400 lbs. The income from this, if parchment coffee is sold at 1/- per pound, would be only £20.0.0 per year for the whole village. Details of production during the past three years are shown in Table 4.

[A] [See Category 102, p. 109--Analyst]

231 pigs and fowls available for feasts, there is no opportunity for
the numbers of livestock to multiply, and demand always outruns
the supply. Nor can the demand be met from neighbouring
[435] villages for they are beset with the same problem. Some
European planters breed pigs for the local market and have no
difficulty in obtaining £10 to £15 for pigs of moderate size to be
killed for feasts. If the problem of the current customary
obligation to make one's livestock available for feasting could be
overcome, pig and poultry breeding for local consumption and
local marketing would appear to be a fruitful source of cash income as well as of protein good.

Economic trees

241 The most important trees in the Inonda subsistence
245 economy are sago, coconut, betel nut, hauga nut, breadfruit, and
pandanus. Sago is used for food as well as construction, while
[124] the others are used for food only. Information on economic
trees was gathered by interview only and, except in instances
where we were able to check during the course of other work,
423 they were not counted on the ground. Economic trees are
usually planted on land held by the lineage of the planter, but as
rights to them are sometimes transferred by gift and inheritance
between individuals of different lineages, sub-clans and clans,
many persons hold rights to trees on land held by descent groups
other than their own. Apart from a right of access, rights in
trees do not entitle the holder to any rights in the surrounding
land.

423 In addition to the rights of those born in Inonda, some
wives claim rights to use economic trees in their home villages.
241 They do not claim exclusive rights to specific trees,(1) but
245 rather the right to harvest some produce from trees held by
their fathers or brothers. This right is usually exercised only
in the event of a shortage of food from the husband's land, or if
the wife is on a visit home. During our stay we observed two
persons exercising such rights - one to make sago about three

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(1) With the exception of one woman who had been allocated specific coconut trees by her father.

423 miles away and another to collect betel nut about fifteen miles
241 away.(1)
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The rights of females who marry outside the village vary according to distance, frequency of contact with the home village and adequacy of supplies of that tree in the locality where they reside. It is said that a widow can return to her village of origin and resume rights which had been exercised by her brothers since her absence. We found no instances of females who live in or originate from this village having exclusive rights to any tree, either in this village or any other, though instances do occur of trees being given by a woman's brother or father to her children.

Unlike in other parts of the Orokaiva country sago
222 does not grow wild in Inonda though some wild sago is collected by Inonda people from other lands in which they hold rights.
[262] Sago is eaten mainly in the latter part of the dry season when other foods are short, or at other times when large quantities of food are needed for funerary or other feasts. What people refer to as 'a tree' is frequently a clump of trees in various stages of growth, but all of which have originated from a single plant.

423 A total of 21 sago trees was accounted for on
241 Inonda lands, but the bulk of sago supplies is obtained from
245 outside the area. Four Inonda people claimed five trees at Sambogo, where their forefathers had lived before shifting to Inonda. All Inonda people claim rights to wild sago growing at Aramba, the "original" home of the Andiriha and Jego'undi clans, and some of them have made sago there in recent years. The Inonda people claim the right, along with other branches of their clans, to use whatever trees they need. People from this village also make sago from wild trees bordering the Embi

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(1) Sago is difficult to prepare and heavy to carry and is usually obtained from the closest possible source, even if this means making arrangements with persons to whom one is not closely related. Betel nut, on the other hand, is light, and it is easier to go a longer distance and obtain it from some close relative than it is to get it closer if that would necessitate contracting obligations with more distant kin.

423 Lakes; those who are related to the Sauhaha people use trees on
the Sauhaha land, and those who are related to the Tandai'undi
241 use trees on their land. Three Inonda men claim rights in six
245 sago trees in their mothers' villages.

Although informants usually refer to trees as being individually owned, in fact they are more often owned by siblings (or half-siblings of the same father) and merely referred to in the name of the eldest male sibling. Thus all but three sago trees in Inonda were owned by more than one person. Moreover, it is apparent that the Inonda people recognise implied qualifications to these rights. The resident adult children of the 'owners' are regarded as having the same rights of use (but not of control or disposal) as their fathers. Qualifications are particularly noticeable in the case of sago and a man who is not using a sago tree can scarcely refuse it to a resident cousin or even an unrelated neighbour who requires it. As a sago tree takes about fourteen years to mature, it is not unusual for a man not to have one ready when he needs it. Also, as a large quantity of food is obtained from each tree, it is common for villagers who are not closely related to exploit jointly a tree which belongs to one of them. During our stay two sago trees were harvested. One group of four men (who belonged to three separate lineages of the same clan, but one of whom lived in Hohota) harvested a tree belonging to one of them. Another man harvested a tree which belonged to his wife's family and was growing in the neighbouring village of Urio.

The village people claimed 104 coconut trees in Inonda and said that (excluding children absent at school) only two non-residents owned coconut trees there. Both were contingent members of the Inonda sub-clans. One Inonda man has 4 trees on his father's lineage land in Hohota, and two others claimed a total of 15 trees in the villages of their respective mothers. Two others claimed that they had rights to trees in their mothers' villages though they had not exercised the rights and were not sure how many trees were involved.

Betel nut does not grow well in Inonda and there are no bearing trees in the area. One man still uses three trees which he planted on the land of a neighbouring tribe in the

423 mountain area while taking refuge there during the war. Two
241 others have been allocated specific trees in their mothers'
villages. One obtains supplies from his wife's village, but most
245 Inonda people must obtain their betel nut by barter or purchase
from villages further inland.

Only two households own hauga nut trees in Inonda (a total of 8 trees). One man has two trees on his lineage land in Hohota village, one has four trees in his mother's village and there are some hauga trees in Aramba which Inonda people harvest on visits there.

Breadfruit are relatively plentiful, 52 trees being noted, not including 2 at Ajoro which are owned by one Inonda man, and 2 at Hohota by another. Some 37 pandanus trees were recorded in addition to one each at Hohota and Aramba. We found no instances of pandanus trees being owned by non-residents other than men who were contingent members of the Inonda sub-clans. On the other hand several breadfruit were owned by the children of women who originated from Inonda but had married elsewhere.

Non-monetary valuables

436 The Inonda people recognize two categories of non-monetary valuables; firstly hambo which are ornaments made of sea shells, pigs' tusks, dogs' teeth etc., and secondly di which are ceremonial head-dresses made of feathers. Hambo and di are exchanged at certain ceremonies and sometimes given in recognition of a service rendered or as a token of apology. They can also be acquired by barter, and there is still some trade in shell ornaments from the coast and in feathers for head-dresses from the mountains. In recent years, however, valuables have frequently been acquired by cash purchase.

It is difficult to value hambo and di in terms of cash and whatever formula one adopts has its inadequacies. It is nevertheless important that some attempt be made to equate them, for valuables and cash are in some circumstances acceptable substitutes for one another (especially in meeting traditional social obligations) and the acquisition of the one is to some extent in competition with the acquisition of the other.

512 461 241 Owing to their employment, the paid workers were able to spend less time on food production, and the average area of food garden was less (per consumption unit)(1) in households where the adult males had paid employment than in those where they did not. The three households wherein the only man had paid work had an average of 0.72 acres under cultivation per consumption unit, the two households wherein the only man did not have paid work had an average of 1.66 acres under cultivation per consumption unit, and the three households containing two men (in each case one working and one not) had an average of 0.79 acres per consumption unit.(2) Food intake was maintained partly by the purchase of store foods, particularly rice. Moreover, the wives of paid workers spent more time than usual in subsistence production, and concentrated more than the wives of other men on harvesting for current use more than [464] cultivation for future use. Planting is not maintained at the normal level when paid work is available, but as the work is casual this has no serious effects (for extra cultivation is done [465] when paid work is no longer available). The present pay-rate of £1.10.0 for a 40 hour week is not sufficient to feed a family from store foods alone, so that continuous work at these rates would probably result in a decline in living standards.(3)

512 461 Men who are engaged in paid work still engage to some extent in other types of productive work. The main substitution is not paid work for other productive work, but paid work for non-productive occupations. This is illustrated by Diagram 2 which compares the activities of paid workers with those of all men for the whole period.

The amount of time spent on social obligations is probably somewhat higher than usual owing to the death men-

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[125] (1) Any person 10 years of age or over was rated as one consumption unit, children 4 - 9 as half, and infants 0 - 4 as one quarter. Temporary visitors were excluded.

(2) The average for the households with two adults was reduced by the fact that in two cases the men remaining at home were either ageing or suffering from long-term illness.

(3) The most reliable indicator of nutritional requirements is the rations scale in the Native Labour Ordinance 1958. This ordinance prescribes minimum quantities of foodstuffs required for indigenous workers and their dependents. The retail cost of the supplies listed is approximately £1.3.0 per week for a single man or £2.19.0 for husband, wife and three children. These prices are for food only.

[TEXT CONTINUED ON PAGE 68]

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The following rough assessment of total days expended on various tasks per year has been made.

Subsistence	Assessed man-days per year (adults only)		
	Men	Women	Average
Bush clearing: 1.1 acres per adult male. We assume that men take about 10 man-days to clear an acre, and are assisted by their womenfolk during 4 man-days.	10	4	7
Planting: 0.5 acres per adult per year shared roughly equally by men and women assuming 8 man-days per acre of planting.	4	4	4
Weeding, maintenance and harvesting: 25% above pilot survey for although during that time harvesting was increased, weeding was reduced due to funerary commitments.	19	109	64
[417] Fencing: One household of 6 adults (incl. 2 visitors) and 2 children erected 239 ft. of fence in 6 hours. Another household of 3 adults built 145 ft. in 8½ hours. This suggests that an adult, as a member of a team, can construct approx. 50 ft. of fence per day. There is a total of 7,148 ft. of intact pig-fence around the food gardens which was constructed during the 12 months preceding our survey. On the average therefore each household makes about 900 ft. of fence per year, which would require approximately 18 man-days per household, or about 7 days work per adult per year.(1)	7	7	7

(1) Wild pigs are most prevalent in the areas which border the Hydrographers Range. In the central parts of the Orokaiva country there are few wild pigs and the people do not build fences. This saves them time but, on the other hand, they cannot supplement their diet with fresh meat to the extent that the "border" people can.

461	Men	Women	Average
221 462 [224] [226] [222] Hunting, fishing and foraging: Taken as 25% below pilot survey (as hunting increased during mourning and fishing increased during dry deason; foraging not fully accounted for as often done in the course of other activities). Hunting all by men, fishing mostly by men, foraging mostly by women	30	8	19
[342] Housebuilding: House rebuilt about every 4 years. Assuming that it takes about 16 man-days to build a house.	4	-	2
Total subsistence activities:	74	132	103
● [241] Cash cropping: Assessed time needed to maintain and harvest area planted (1.85 acres) averaged over all adults.	6	6	6
Council work: Road work say 4 days per man per year.	4	-	2
Church: Services 2 hours per week, plus church celebrations 2 days per year.	17	17	17
Sickness (including caring for the sick): Based on survey period.	23	29	26
Paid work: Based on actual paid work undertaken so far this year.	72	-	36
Total other activities:	122	52	87
Social obligations			
Death: Based on 2 deaths per year in this village, each involving the equivalent of 10 days absence from productive activities; and 5 deaths elsewhere which concern Inonda people involving 3 days each.	35	35	35

429 necessary for the normal growth of the tree or trees concerned.

[245] In contrast to the random pattern of planting of traditional tree crops, coffee and cocoa must be planted contiguously and in relatively large numbers. It is not normally feasible for the land to be used for any other purpose at the same time, and it is therefore desirable that the planter have effective control of the land. Clear identification of rights is particularly necessary because of the value of the crop. It may also be desirable in giving the individual a degree of freedom from his descent group, for as more facilities are provided by larger institutions (local and central government agencies, missions etc.) the need for co-ordinated action by the descent group diminishes and it may even function more to limit the aspirations of members than to supply their needs.

There would not seem to be any advantage in defining or registering lineage boundaries, or the food gardening [241] [613] areas of individuals. People frequently plant food crops on the land of other lineages and this does not seem to cause any acute problems. It is a matter of convenience, done at the invitation of the rightholding lineage, and it results in a reduction of bush 425 clearing and pig-fencing. Furthermore, there are accepted processes of transfer of proprietary rights from one lineage to another and we recorded several such instances. The transfer is seldom completed in a single transaction, but rather takes place over time, and the nature of the rights transferred is modified by occupation and other circumstances. Even if short-term cash crops (such as peanuts or rice) were introduced, it is unlikely that major tenure problems would result unless cropping were undertaken on a large scale.

Aspects of work organization which inhibit productivity

461 There is at present a considerable surplus of working time available over and above that required for subsistence and cash cropping. Table 11 (page 63) shows that the average time spent per week on subsistence activities and cash cropping was 14.7 hours for men and 16.0 hours for women. This suggests that E.K. Fisk's comments to the effect that the unexploited labour supply of South-East Asia is one of its major sources of productivity may equally apply here.(1)

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(1) Fisk, 1961:778.

461 apply only to activities which are traditional or local. They do not apply with the same intensity to wage labour outside the village.(1) If major increases in cash cropping were to eventuate the amount of time now spent in festivities would need to be reduced or, alternatively, bought foods would need to be substituted for garden crops at feast times.

Other limiting factors

241 Income: Past experience has made people cautious about the prospects for their present cash crops. They are aware of the failure of the attempt to establish oil palms as a cash crop in the 1920's, of the abortive sugar project of the early 1930's, of the compulsory planting of coffee in the same decade and the subsequent collapse of the coffee market with the outbreak of war, and of the introduction and failure of rice cultivation in 1948-49. Some are aware too of the collapse of the peanut market within two years of the introduction of peanuts as a plantation crop in 1957. It was not, however, tried as a village crop on any significant scale. Though the people are not aware of the precarious state of the world market for coffee and cocoa today, they are aware of the price decreases over recent years.

245 434 Income from cash crops is not only uncertain, it is quite small and the people derive much less income from their coffee than they expected. This is due in part to unrealistic expectations, but also to decreases in price between the time of planting and the present,(2) and to inadequate knowledge of coffee husbandry. In the village context it is unlikely that the average man could, after meeting his family's subsistence needs and social commitments, clear and maintain more than two and a

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[796] [178] (1) We are nevertheless informed by many Orokaiva people that the number and duration of traditional ceremonies and the number of people participating in them have all decreased markedly during recent years. They have been replaced to some extent by church festivals and sports but these activities are said to take much less time. This view is confirmed by comparing the social activities of today with those described by Williams, 1928 and 1930. The period of mourning after death has in particular been reduced and now involves fewer people.

[435] (2) The cash price per pound paid to the grower was 2/- in 1959, 1/6 in the early part of 1960 and 1/2 in the later part, and 1/- in 1961-2. The price at present being paid is 11½d. per lb.

121 ambitious men could be resettled on individual holdings outside Inonda. There is no indication that freehold tenure within Inonda would facilitate improved productivity any more than the Higaturu Council registration scheme.

[241] [493] It is apparent that the highest productivity per man and per acre at present is achieved on the large-scale European plantations and the individual family holdings for Papuans, both of which are financed largely by government loans. The degree to which developments of this type can be extended is limited in practice by the volume of funds available from or through government agencies. The comparative productivity of these two forms of organization is now being analysed and it is hoped that the results will be available in the next few months.(1)

It is likely that at this stage only a few Inonda men would be suitable for resettlement on individual blocks, with development loans, but a number would be both suitable and willing to work as plantation labour. The feasibility of encouraging the ownership of plantations by Papuans seems to merit exploration, for experience elsewhere in the Pacific in recent years suggests that in conjunction with expansion of cash cropping by individuals or families, plantation agriculture operated by indigenous entrepreneurs may provide an important avenue to increased output from commercial agriculture.

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(1) A paper on the Popondetta plantation economy is in the course of preparation by Dr. Diana Howlett and another on the government-sponsored family holdings by Mr. R.J. Cheetham. Both will appear in subsequent issues of this Bulletin.

APPENDIX A

The Higaturu Local Government Council Land Registration and Coffee Processing Schemes

657 The Higaturu Local Government Council was formed in April, 1956. It serves 12,000 people who belong to the southern Orokaiva culture group of the Northern District of Papua, and has 54 councillors to represent its 86 villages (of which Inonda is one).

Land registration

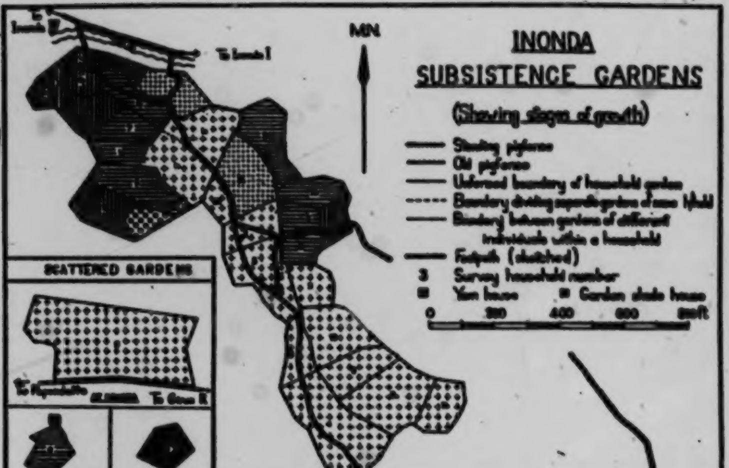
657 In the first year of the council's operation the Native
423 Affairs officer who was responsible for supervising council
affairs initiated a system of registering with the council all lands
[241] which were being used for cash crops. In practice, persons
wishing to plant cash crops under the scheme applied to the
supervising officer, who thereafter made a chain and compass
survey of the land concerned, in the presence of the elders of the
landholding clan. The councillor for the area also attended.
A written declaration was made and witnessed by the clan elders,
the local councillor, the applicant and the Native Affairs officer.
The declaration allotted the land to the applicant and stated that
he could thereafter transfer it or nominate heirs to it, without
further reference to the clan or other group. The land
described in the declaration was then entered in a register by
the council clerk.

During 1957 after about 150 blocks had been regis-
tered, the acting District Commissioner ordered that the
scheme be stopped on the ground, it is said, that it did not
conform to traditional practice. No statement of policy was
issued, but no further registrations were made for nearly three
[241] years. The people were uncertain of the status of the registra-
tions which had already been made but coffee planting continued
throughout. In fact, the man who was then District Agricultural
Officer considers that there was more planting during 1957-60
than either before or since.

It is understood that the main issues at stake were (a) whether the scheme constituted a modification to custom or

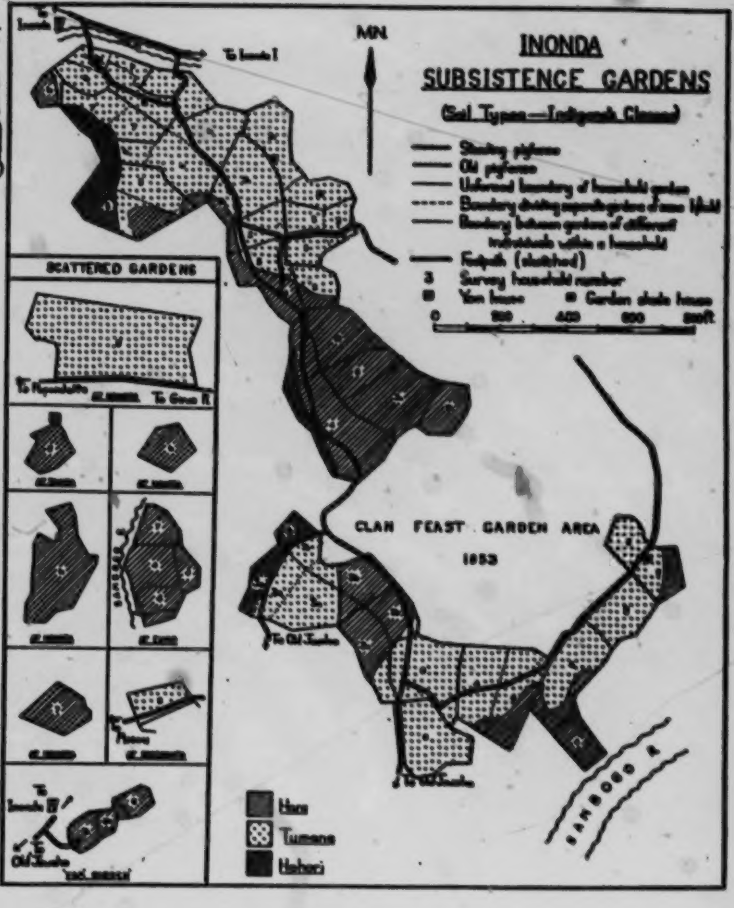
14: Crocombe & Hogbin E-5 (no date) 1963 OJ23 Orokaiva OJ23
Inonda

102
311
241
361
487


MN
INONDA
SUBSISTENCE GARDENS
(Showing stages of growth)
Standing pigfence
Old pigfence
Unfenced boundary of household garden
Boundary dividing separate gardens of same h'hold
Boundary between gardens of different individuals within a household
Footpath (sketched)
3 Survey household number
Yam house
Garden shade house
0 200 400 600 800ft
To Inonda I
To Inonda III
SCATTERED GARDENS
CLAN FEAST GARDEN AREA
1953
To Old Inonda
SAMBOGO R.
Garden cleared, not yet planted.
Garden planted, not yet producing.
Garden cleared, will not be planted.
Garden currently producing.
Abandoned garden.
Cash crops.

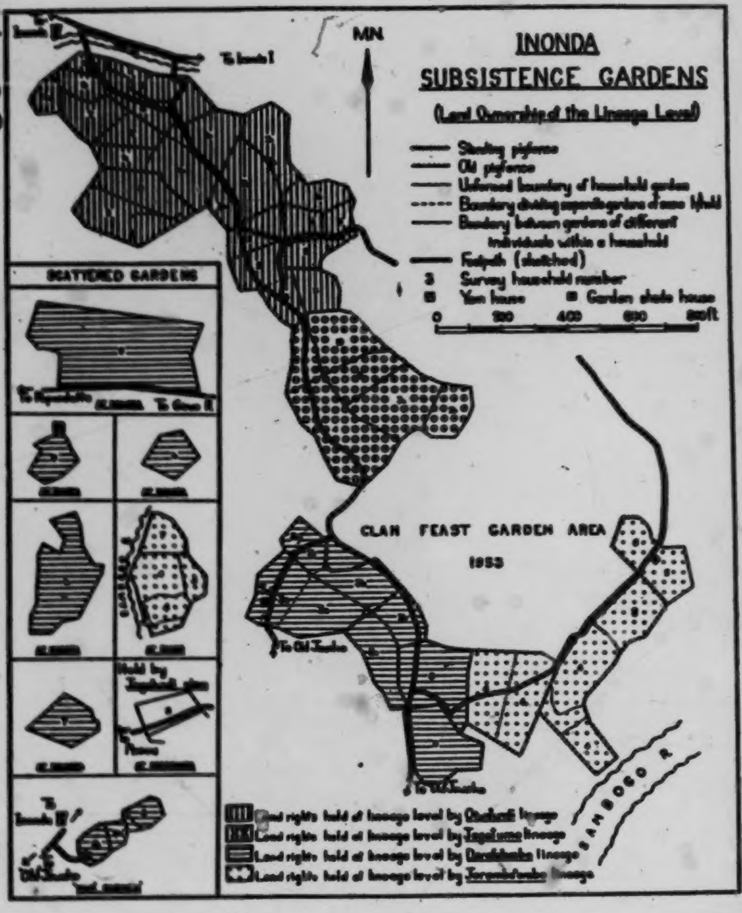
14: Crocombe & Hogbin E-5 (no date) 1963 OJ23 Orokaiva OJ23
Inonda

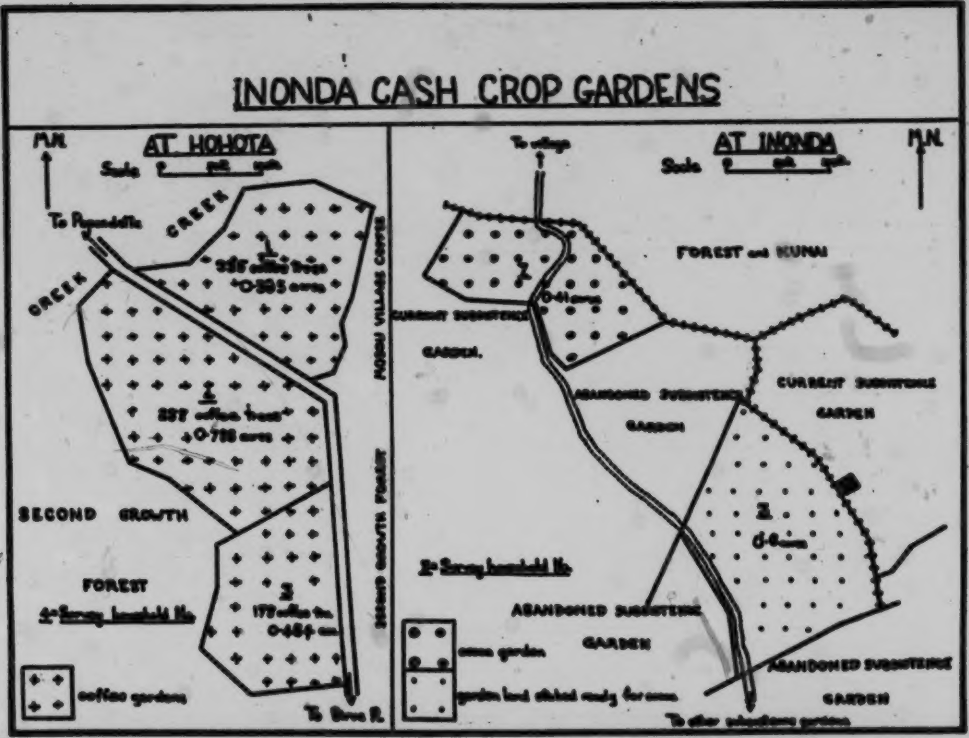
102
311
241
361
487
823


INONDA
SUBSISTENCE GARDENS
(Soil Types—Indigenous Classes)
Standing pigfence
Old pigfence
Unfenced boundary of household garden
Boundary dividing separate gardens of same h'hold
Boundary between gardens of different individuals within a household
Footpath (sketched)
3 Survey household number
Yam house
Garden shade house
0 200 400 600 800ft
MN
To Inonda I
SCATTERED GARDENS
CLAN FEAST GARDEN AREA
1953
SAMBOGO R.
Tumana

14: Crocombe & Hogbin E-5 (no date) 1963 OJ23 Orokaiva OJ23
Inonda

102
241
423
613


INONDA
SUBSISTENCE GARDENS
(Land Ownership at the Lineage Level)
Standing pigfence
Old pigfence
Unfenced boundary of household garden
Boundary dividing separate gardens of same h/hold
Boundary between gardens of different individuals within a household
Footpath (sketched)
3 Survey household number
Yam house
Garden shade house
0 200 400 600 800ft
MN
To Inonda I
SCATTERED GARDENS
CLAN FEAST GARDEN AREA
1953
To Old Jumbo
BAMBOGO R.
Land rights held at lineage level by [illegible] lineage
Land rights held at lineage level by [illegible] lineage
Land rights held at lineage level by [illegible] lineage
Land rights held at lineage level by [illegible] lineage



INONDA CASH CROP GARDENS

AT HOHOTA
M.N.
Scale
To Popondetta
CREEK
CREEK
1
335 coffee trees
0·393 acres
2
297 coffee trees
0·788 acres
3
178 coffee trs.
0·484 acres
SECOND GROWTH
FOREST
Survey household No.
coffee gardens
SECOND GROWTH FOREST
AT INONDA
M.N.
Scale
To village
FOREST and KUNAI
CURRENT SUBSISTENCE
GARDEN.
ABANDONED SUBSISTENCE
GARDEN
CURRENT SUBSISTENCE
GARDEN
2
0·41 acres
3
0·6 acres
Survey household No.
ABANDONED SUBSISTENCE
GARDEN
ABANDONED SUBSISTENCE
GARDEN
cocoa garden
garden land staked ready for cocoa
To other subsistence gardens

472 marketing or the more intricate techniques of production. It does
554 suggest, however, that they have a sufficiently clear conception
of the way to achieve the goal (and the way is more important than
153 the goal itself) to enable them to organise and to act. It is
apparent that the entrepreneurs studied were highly motivated.[1]

Land and food gardens

241 Most Orokaiva men established their cash crops on customary
423 land to which they have acquired rights by inheritance from their
[428] fathers. None of the entrepreneurs did so, though all claim that
they could have done had they wished but deliberately chose not to.
[472] Each stated that the reason was to avoid claims by kin to their
land, produce or income.

241 A had cleared bush land and planted coffee at Garara where his
423 close kin had been permitted to resettle in the late 1920s. Though
the host clan did not mind the newcomers planting food crops they
472 objected to cash crops and forced him to abandon it. About 1930
the newcomers purchased about 2,000 acres of virgin bush land at
Kapurahambo from the clans of Soputa. The transfer was accompanied
by a series of feasts and dances and the distribution of traditional
valuables. The land was divided among the buying group, A and his
two brothers being allocated an area of eighty-one acres on which
they have since planted cocoa and coffee. A has applied for re-
[656] gistration of his land under the Land (Tenure Conversion) Ordinance
1963.

B claims he had extensive customary land available to him and
this is confirmed by other villagers. But for his cash crops
(coffee and cocoa) he chose to clear an area of unoccupied bush
land which had formerly been owned by a small group which had been
decimated and the survivors scattered decades before. B thought
he would acquire exclusive rights to the area he cleared (Crocombe
and Hogbin 1963b:72-3). He subsequently improved the security of
[656] his title by registering this land under the Higaturu Council land
registration scheme, a transitional scheme, now superseded. He
has since applied for registration under the 1963 legislation.

C has rights to hundreds of acres of customary lands. For his
[432] cash-cropping, however, he chose to use two adjacent blocks of a
total of 106 acres which had been purchased by the government for
European settlement in the 1920s for 54 pounds of tobacco, one
tomahawk and one knife. The European lessor planted coconuts but
abandoned the property before the second world war. Though legally

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[1] A better understanding of this aspect will be achieved by research to be undertaken in 1967 by Ruth Finney of the University of California.

241 it reverted to the Crown, C, as grandson of the main original
423 vendor, regarded himself as having a right in the abandoned pro-
472 perty. After some years of negotiating he now has a ninety-nine
year lease at an annual rental of $7.95. Here he has planted
[427] cocoa and coconut trees.

At any time during his twenty years' employment D could have returned to his home area and planted cash crops on the ample
family lands there. It was only when the opportunity arose of a
[654] resettlement block with a development loan of $1,500 that he
[426] decided to undertake cash-cropping; he has now planted over
3,000 cocoa trees.

472 Few Orokaiva are short of land in the area east of Popondetta
423 where the entrepreneurs are located. Land availability is not a
factor differentiating entrepreneurs from villagers, but the availability of land other than that held under customary tenure may well be.

The entrepreneurs appear to be more efficient food gardeners
241 than many Orokaiva, for even though they average less time garden-
472 ing (see Table 6)^A they have more extensive gardens, as shown in
184 the following table.

Table 1

Area of land under cultivation for food gardens (acres)

	Per head of population	Per able-bodied person over 16	Per household
A's hamlet*	-	-	1.45
B's household	1.20	1.20	3.61
C's household	0.67	2.36	4.72
D's household**	0.75	1.50	3.00
Average	0.65	1.26	3.19
Average for Inonda and Sivepe***	0.34	0.69	1.48

* Measured for the six household heads in A's hamlet in December 1965 at the end of a long drought. They estimated their normal garden area to be nearly double this. A lives in a hamlet com-
[592] prising himself, his brothers and some of his married children. The hamlet is a short distance from the village of Kapurahambo.

** Estimated, not measured.

*** From Crocombe and Hogbin 1963b:10, and Rimoldi 1966:19. Inonda
[361] is a village on the sparsely settled plain, Sivepe village is located in the more fertile hilly country where population is denser. They were chosen as apparently representative of the two major ecological zones inhabited by the Orokaiva. All four entrepreneurs live in the former, plain zone.

A.[Table 6 appears in Category 461, p.19--Analyst]

Cash crops

472 All four entrepreneurs were familiar with the very small scale
cash-cropping which had been undertaken in their villages for many
241 years, but because of the insignificant returns received from
activity of this kind they wanted to avoid it. In discussions
with the writer, they all referred frequently to their aim to plant
on a large scale and to operate their plantations the way European
planters did. The main differences were that the entrepreneurs
[471] were without capital and that they were prepared, at least until
[464] the enterprise was established, to undertake manual labour themselves.

The entrepreneurs A, B and C established their enterprises with
472 the help of their wives and of certain close junior kinsmen. Each
241 has occasionally hired labour, but none has been able to keep the
464 workers for more than a few months (though one man worked for A
for three years). The crops grown (coffee, cocoa and copra) are
592 all labour intensive. Moreover, A and B had to clear heavy forest
and C heavy undergrowth. A was helped by two younger brothers and
in more recent years by two sons and a son-in-law. B has had the
full-time labour throughout of his younger bachelor brother who
lives as a member of B's household. C was able to enlist casual
aid from his two younger brothers in the early establishment phase
(and to a lesser extent from his father and his sister's son for
food gardening). It is perhaps significant that none of them has
called on more distant kinsmen, and none has called on unrelated
people of the same village or neighbourhood. The reasons they
gave, when questioned, were that the local people were lazy or
resentful of their relative prosperity and, in the case of kinsmen,
that they might expect disproportionate or inappropriate reciprocity.

B entered into an agreement with four men of two villages a few
472 miles from his own whereby they all helped each other clear separate
241 coffee plots in 1952. As B's was much larger than the others he
464 agreed to provide a small manual coffee pulping machine which all
four could use. There was some dissatisfaction by those with small
476 plots with the proportionate benefits derived from the mutual help
arrangement, and when B established his cocoa plot in 1959 only he
423 and his brother worked on it.

241 What rights do the close kin acquire in the crops they have
464 helped to establish? Orokaiva people frequently assist one another
to clear land for gardens and this involves no obligation beyond
476 reciprocal help. But planting, husbandry and harvesting were
[592] traditionally done by the household and were thus closely associated
with rights to the crop. A's enterprise began as a joint venture
241 with his brothers, though the initiative was provided by A. It
was not until after World War II that he encouraged and assisted
472 each of his brothers to plant their own individual coffee gardens.
592 A's gardens were then to be for himself and his sons jointly.
476
423

241
472 Later again, in line with an agricultural officer's recommendation,
he encouraged each son to plant individually. He proposes that his
592 gardens should be inherited by his sons jointly, with work and
423 profits being shared by them.

428 B's bachelor brother speaks of the cash crops as B's even though both have worked on them equally together, but says that B 'looks after' financial and other matters on his behalf. Whichever of them dies first the other will inherit, but when both die the assets will be inherited by B's only surviving son, a former teacher who shares no interest in cash-cropping.

C claims sole rights to his plantation on the ground that he
has compensated his brothers for their help with gifts and by
assisting them to establish their own cash crops. There is reason
to believe, however, that if C dies before his children are adult,
his brothers will probably claim a share. Some other people of
[578] C's village regard the plantation as belonging to several sub-
clans jointly and their challenge to his rights was a real threat
until he was issued a formal lease.

472 D has no younger brothers, but he did have a government loan
241 (though it was not intended for hiring labour). With the loan
and gross profits from his store (see p.11 ff.) he has hired a
464 total of seven workers at various times. As with the labour
[654] occasionally hired by the other entrepreneurs, they have all left
within a few months of engagement. The employers give no adequate
explanation for this and, as I have been unable to contact the
former employees, the reasons can only be postulated. In some
cases the employer has had insufficient money to pay them but this
has not always been the case. Almost all employees have come from
twenty to a hundred miles away and most are from different language
and culture groups from the employing entrepreneurs. This may well
[466] be due to the fact that the employer-employee relationship, with
[571] its clear-cut subordination, has no traditional precedent and is
incompatible with Orokaiva notions of appropriate interpersonal
relationships. New relationships of this kind are probably easier
to establish with strangers and outside one's own community.

Since his attempts to engage permanent paid labour were not
[621] successful, in recent years A has frequently arranged for the
people within his hamlet (his children, his brothers and their
[602] children, two father's brother's sons and all their spouses) to
undertake short-term tasks such as clearing or harvesting. At the
end of each task he compensates them in cash or store goods. None
of the others has developed this sort of arrangement.

472 The entrepreneurs have all benefited from assistance given by
654 government officers. Before the war A marketed his coffee through
the government and he speaks of the Resident Magistrate assisting
him to import and install a coffee machine and open a bank account.

472 Agricultural extension services were begun about 1950. A, B and
654 D had close relations with particular officers and received
242 significant help from them.

The number of cash crop trees owned by the entrepreneurs in
472 December 1965 is shown in Table 2, together with the number of
423 years since that person began cash-cropping. An attempt was made
to estimate the number of adult male kin and the number of employees
472 who have worked with each entrepreneur in terms of man-years, but
464 this was unsuccessful because the people have no clear measure of
the periods of time spent by each worker with the employer. Even when the period is reasonably accurately known it is difficult to use comparatively, for relatives who assist do so only from time to time and even employees were often not paid a regular wage nor expected to work all the time.

Table 2

472
423
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Commercial trees owned by entrepreneurs in December 1965

Entrepreneur	Years since cash-cropping began	Coffee trees	Cocoa trees	Coconut trees	Total trees	Acres*
A	20**	4,400	3,500	-	7,900	22.9
B	14	2,512	1,153	-	3,665	9.6
C	13	-	717	340***	1,057	8.5
D	5	-	3,337	-	3,337	13.3

* Estimated from tree figures using conversion ratios of: 500 coffee trees per acre; 250 cocoa trees per acre; 60 coconut trees per acre.

** As most of A's pre-war trees were destroyed during the war, only his post-war cash cropping experience is considered here.

*** Most of these are old coconuts which were growing before C took over.

423 There may be a slight relationship between number of trees and
the period since cash-cropping began, but I suspect there is a
241 greater correlation between extent of cash crops and the supplement-
464 ary labour used, whether mainly from kin in the case of A, B and C,
or by using loan funds as in D's case.

Retail trading, manufacturing, processing and transport

472 All four entrepreneurs own stores. A and B aspired to own trade
441 stores for many years but did not establish them until they had
literate sons to act as managers. The other two entrepreneurs are
(212) themselves literate. An illiterate employee operates C's store but

Chapter 1

Introductory

657 The first legislation aimed at encouraging Papuans to engage in
654 cash cropping was introduced in 1894 by Lieutenant-Governor MacGregor
241 six years after the beginning of the British administration in Papua.
Nevertheless, policy was mainly directed towards the promotion of European enterprise until after the 1914-18 war, when the difficulty of attracting European settlers to Papua caused a shift towards promotion of indigenous agricultural development.[1] At first communal cash crop gardens were promoted but as the disadvantages of this system became known,[2] emphasis shifted to encouraging each family to cultivate an area of cash crops separately. Cheetham (1962:68) states that this policy was clearly established by 1956.

657 An ad hoc committee was established in November 1956 to consider
423 the conversion of land from customary tenure to individual freehold title.[3] The committee submitted its report in 1957 and there followed a period of research and discussion, culminating in the policy statement on land tenure in the House of Representatives on 7 April 1960 in which the Minister said:

> (1) The ultimate objective was to introduce a single system of land holding regulated by the central Government by statute, administered by the Department of Lands of the central Government, and providing for secure individual registered titles after the pattern of the Australian system.
>
> (2) Only the central Government...may issue and register land titles.

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[1] On the history of official policy on agricultural development see Crocombe 1964a.

[2] See Crocombe 1964a:33-7.

[3] Land under 'customary tenure' includes 97 per cent of the total area of Papua-New Guinea. The Administration has purchased 2.5 per cent of the total area, and non-indigenes have freehold title over 0.5 per cent.

423 614 This has been documented by recent research carried out in three Orokaiva areas: at Inonda by Crocombe and Hogbin (1963:28), among the Yega by Dakeyne (1965), and at Sivepe by Rimoldi (1966:95).

[361] [241] Under the traditional Orokaiva tenure system most individuals have rights to several pieces of land scattered throughout the area claimed by the clan. Thus an individual often has to walk some distance from one food garden to another and he may have only a small area of land on each plot. These facts were significant in determining the attitudes of the Ombi-Tara people to tenure conversion (see Chapter 3).

An individual is considered to have a presumptive right to clear bush behind his plot in order to extend his planting, without consulting other members of the clan.

423 311 241 476 Clearing of bushland is often a community affair, with the lineage and sometimes the whole sub-clan co-operating, but planting is organised by individual households, with some reciprocal assistance from other households for specific tasks at irregular intervals.

Land use

241 311 The Orokaiva grow their crops using a system of bush fallow rotation - sometimes called shifting cultivation - which is common in many tropical areas. Newton (1960:81) describes it as a system under which land is cleared and cropped for two or three years, after which the cultivator allows it to revert to natural vegetation cover and shifts to a new garden. He may abandon land because depletion and erosion cause declining yields, but in many instances he does so because less labour is involved in clearing new land than in using old gardens where weed and pest species are established. Brookfield and Brown (1963:166) suggest that in the absence of fertilisers, capital equipment and improved techniques of agricultural production, no successful alternative to bush fallow rotation has yet been found for tropical agriculture.

Residence patterns

361 [592] [621] [614] The Orokaiva live in villages but each nuclear family usually occupies a separate house. In pre-contact times villages were large, probably because clan members clustered together for mutual protection (Williams 1928:155). However, in 1928 Williams noted a growing tendency for small groups to form independent settlements. Families sometimes lived 'for weeks at a time in their garden houses...no small distance from the permanent village.... Some families...settle permanently on the site of their distant gardens' (Williams 1928:129).[1] The present fairly large village appears to be a relatively recent return to the pre-contact pattern.

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[1] Native Regulation No.90 of 1922 stated: 'The practice of people abandoning their old homes in settled villages and scattering

654 657 311 241 Planting of cash crops on converted blocks has proceeded steadily. The forty blockholders at Ombi-Tara planted an average of three acres of high-yielding rubber each in the first fourteen months. At Barisari fifty-six blockholders have planted an average of two acres of coconuts in fourteen months and this was expected to increase to four acres by the end of 1966 (Williams 1966:6). Blockholders at New Warisota have planted an average of three acres of cocoa after eighteen months. By contrast, fifty-seven farmers at the Yega scheme have averaged slightly less than one acre of cocoa planted in more than three years.

654 657 A rough attempt was made to estimate the value of the time, materials and services expended on the conversion schemes in the Popondetta area.[1] This worked out at approximately $8 per acre[A] or $162 per block.[B] This suggests that the growth of conversion throughout Papua-New Guinea on a sufficient scale to have a significant economic and social impact will depend, inter alia, on the development, with experience, of less costly technical and administrative procedures.

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[1] See Appendix A.[C]

A [Corrigendum: For $8 read $6--Analyst]

B [Corrigendum: For $162 read $116--Analyst]

C [See Category 423, pp. 38ff.--Analyst]

Chapter 3

Motivations and expectations of the Ombi-Tara people

Desire for improved standards of living

185 177 The Ombi-Tara people aspire to what they consider to be a European way of life. They consider that by planting a new crop, rubber, under a new land system they may be able at last to realise their aspirations. The first response of 90 per cent of the blockholders interviewed to the question 'Why did you get a block?' was 'to get money'.[1]

In any formal or informal discussion concerning the reasons for wanting to grow cash crops or for being in favour of tenure conversion, the same points were mentioned repeatedly - the desire for a European house with an iron roof, clothing and food from the store. Some more ambitious men suggested that they hoped to establish trade stores or workshops, to buy vehicles, or less [241] specifically, 'to start a business like Europeans'.[2] At least 20 per cent of the villagers appear to consider the change from planting cocoa, coffee or food crops to planting rubber to be as significant as the innovation of conversion.[3] The villagers hope that rubber will produce substantially greater returns than they were receiving from their cocoa plantations.[4]

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[1] The methods of obtaining information are described on pp.1-2.[A]

[2] These replies tend to support Epstein's finding (1965:191) in New Britain that villagers often wish to copy not only European consumption patterns but European productive activities as well.

[3] Most people had had some prior experience with rubber, either through the Ombi-Tara bush rubber stands or the Sangara rubber plantations, but few had planted rubber as a cash crop.

[4] As Brookfield has pointed out (1958:24): 'It is quite wrong to suppose that the economic factor can be disregarded in native development. Native toleration of low returns is greater only in degree than that of established European plantations.'

A [See Category 128--Analyst]

Security of tenure

423 It is often suggested that the main benefit from tenure conver-
sion is the provision of security of tenure for villagers who wish
241 to plant cash crops. The Ombi-Tara people, however, did not con-
[182] sider security of tenure as a major benefit of conversion. They
explained that each man had previously held individual rights to
[829] land which were sufficiently secure for him to plant cocoa and
coffee. A man could plant such cash crops without consulting the
clan leader or other members of his clan, and without others
disputing ownership of the crop or distribution of the proceeds.
[578] Fourteen people did mention that conversion and the introduction
of cement and wooden corner pegs would help to prevent disputes; but they felt the disputes to have been caused by the previous small size of individual plots which sometimes made it difficult for a man to extend his planting (because he would be encroaching on another's land); and to vagueness of boundary lines. Some also referred to the need to clearly mark out land boundaries to forestall potential encroachment by persons from outside Ombi-Tara.[1]

Consolidation of holdings

423 Most Ombi-Tara people saw consolidation of their previously
scattered holdings as the main benefit from tenure conversion.[2]
311 Many people drew finger diagrams on the ground to explain how
361 conversion led to consolidation. Under the traditional tenure
system cash cropping involved long walks from village to food
[829] gardens and to cash crops.[3] Consolidation not only reduces walk-
ing time, but also allows an individual to undertake large-scale planting in a single area. He was previously unable to do this because of the small amount of land he held in each plot, and in some cases because of the small total amount of land to which he

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[1] In contrast to the Ombi-Tara situation Crocombe and Hogbin (1963:72-80) found in another Orokaiva village that lack of security of tenure was a factor discouraging certain individuals from planting cash crops.

[2] Mentioned by thirty of the thirty-seven blockholders interviewed, including the four most influential people - Charles, the two clan leaders and the Local Government Councillor. These people should be distinguished from the 20 per cent or so mentioned earlier for whom the innovation of conversion was less significant than the change to planting rubber.

[3] Waddell (1966:7) found in another Orokaiva village that time spent travelling to and from places of activity was about 15 per cent of the total time devoted to that activity.

Chapter 4

Effects of conversion at Ombi-Tara

Land use

657 423 182 Since conversion the blockholders have each planted an average of three and a half acres of high yielding rubber and some have cleared a further two or three acres in preparation for further planting.

311 241 Most households are interplanting their food crops with the rubber seedlings as they say it saves time and effort if all crops are on one plot instead of scattered as before conversion. Thirteen people reported that they have food crops growing on unconverted land outside their blocks. Six of these had blocks about twenty-five minutes' walk from the village, and have planted some food on clan land closer to home. Three of the others said that they intended to transfer their food crops on to the blocks shortly. Three people reported that they have coffee trees which were planted before conversion growing outside the block.

[614] The Ombi-Tara people intend to keep the clan land outside the converted area for use by future generations or by members of the present generation who wish to expand their holdings.

Residence patterns

657 423 182 [361] Those people whose blocks are closest to the village have tended to remain in the village. Those with more distant blocks have either abandoned their village houses and moved to the blocks - six families have done this - or planted some food crops on clan land close to the village to avoid having to walk long distances to get food.[1]

[592] The traditional Orokaiva custom of living in single family households has been maintained, with only four of the thirty-five households at Ombi-Tara containing more than one family. In three

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[1] Dakeyne (1965:136) notes that the Yega people moved on to their blocks soon after the Yega conversion scheme began.

121 The need for credit at Ombi-Tara where rubber is being planted
may be less than at schemes where other crops are being promoted.[1]
452 Bauer (1948:318) stated that where tapping and processing of rubber
is done by family labour, 'many small-holders could almost be referred to as no-cost rather than low-cost producers'. The visiting World Bank mission suggested that credit could play an important part in securing local interest in planting rubber in consolidated areas, in organising group processing and marketing, and in providing scope for enterprising men to increase production (International Bank for Reconstruction and Development 1965:111).

It has been suggested both by the District Commissioner (Williams 1966:7) and by a former Agricultural Officer in the Northern District (Cheetham 1962:67-78) that it may be an appropriate time to reassess official credit policy, looking particularly at the criteria for providing credit to smallholders. Cheetham (1962:77) concluded: 'A farmer's ability to repay may be a better criterion on which to provide loan capital than the present notion of "credit-worthiness" in the sense of adequate tangible farm assets.'

Cash cropping and productivity

657 It is too soon to determine the effects tenure conversion will
have on cash cropping and productivity. However, even at this early
423 stage a few observations may be made. The acreage under cash crops
182 at Ombi-Tara has increased significantly since conversion. Before
[311] conversion was introduced, 167 cocoa trees, 92 coffee trees and 19
bush rubber trees were planted per adult male at Ombi-Tara.[2] In the fourteen months after the villagers began planting high yielding rubber on the converted blocks an average of 304 seedlings was planted per adult male.

[434] There is no shortage of food or suitable agricultural land. Both
terrain and climate are favourable for growing rubber. There is easy
[464] access to Ombi-Tara from Popondetta. Villagers are able to earn money
to buy rubber seedlings from the Department of Agriculture by tapping their bush rubber, by working on road maintenance, or by working for wages on the Sangara ex-servicemen's plantations. The proximity of the Sangara plantations and the existence of bush rubber stands at Ombi-Tara provided villagers with experience in tapping and handling
[177] rubber. The Sangara plantations also serve to demonstrate a 'European
way of life' which many villagers find attractive and wish to emulate.

Tenure conversion appears to have contributed to the improved
[241] cash cropping performance mainly by reducing the labour inputs
required to establish cash crop gardens, thus increasing labour

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[1] For example, the processing of green leaf into tea requires substantial investment (Clayton 1961:623).

[2] Excluding the two 'outside' blockholders and a man from Tara who declined to be interviewed (see p.1).

657 productivity. Consolidation of an individual's scattered plots
423 reduces the amount of time devoted to travelling and increases the
182 acreage which can be planted with cash crops in any one location.
The road running through the converted area allows easy access to
241 all holdings and facilitates interpersonal co-operation by reducing
the amount of travelling time involved.

657 Consolidation has facilitated the provision of assistance by
423 Department of Agriculture staff, increasing the effectiveness of
officers. Planting, pest control and general crop maintenance can
182 be more efficiently supervised where there is easy access to all
242 holdings.

Increased assistance from the Department of Agriculture has been an extremely significant factor in the increase in cash cropping activity at Ombi-Tara. In the Northern District there are more agricultural extension officers per head of local population than in most areas in Papua-New Guinea.[1] The diligence, patience, and understanding of the Agricultural Officer who initiated the conversion scheme, the stationing of an Agricultural Assistant full time at Ombi-Tara to supervise the rubber nursery and the bush rubber processing unit, and the regular visits of extension officers from Popondetta have helped to provide the essential technical and managerial skills which are lacking in the village situation.

657 Tenure conversion appears likely to enable economies of scale
423 when the rubber trees come into production, hence increasing the
productivity of village labour. Economies may be gained in pro-
182 cessing the latex, since the relatively large output may warrant
433 the introduction of larger and more efficient processing equipment;
in transporting the processed rubber in bulk; and in marketing. One of the problems previously faced by Ombi-Tara cocoa producers, especially when prices were low, was that buyers did not consider it worthwhile to make the journey to Ombi-Tara from Popondetta for the relatively small amount of produce.[2]

While conversion introduces economies of large scale production it also retains one of the better features of the small holding system, the maintenance of individual incentives to increase production.

Ombi-Tara experience appears to support the well-known maxim of the Food and Agriculture Organization that tenure reform, in order

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[1] The principle of concentration of development effort was endorsed by the visiting World Bank mission (International Bank for Reconstruction and Development 1965:35).

[2] The argument for increasing returns to labour in an economy moving from pure subsistence to the production of a market surplus has been stated by Fisk 1964:164.

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[Housewife carrying garden produce and firewood back to her village, a distance of up to four miles. Her load, excluding baby, is about 100 pounds.]

INTRODUCTION

433 THE traditional economy of New Guinea
villages was radically different from our own.
Whilst our economy is based upon the produc-
tion of surplus goods which can be sold for
profit, thus providing capital which in turn
may be invested to produce greater profits,
the key note of the New Guinea economy was
433 self-sufficiency. Traditionally, the people of
New Guinea were subsistence cultivators plant-
241 ing their food crops in small clearings in the
[226] forests and supplementing this food supply by
fishing, by hunting the animals which live in
[224] the forests and on the grasslands and by gather-
[222] ing the edible produce of wild vegetation,
notably sago. Only the simplest implements
[412] were available: stone axes with which trees
could be laboriously felled or ring-barked;
[372] fire for burning-off the mass of felled timber,
vines, and leaves; and sharpened sticks with
which holes were made for planting seeds
and cuttings. In only a few limited areas, notably the central highlands of the main island, was there any attempt at digging or cultivating the soil prior to planting; in most areas cuttings or seeds were planted in holes made directly in the cleared, ash-covered ground.
[128] The burned clearing thus made and used for
the growing of food crops is referred to in this
book as a swidden.

433 Such an economy, in which there was no
241 concept of saving and no profit motive, tended
to be resistant to change; innovation was un-
177 necessary. But with the coming of white men
possessing a superior technology, an important
[412] change occurred; steel axes, knives, and spades

[P.I-A]

433 were introduced. The use of these tools has
241 greatly lightened the work of the New Guinea
177 gardener and substantially reduced the time
(412) needed to produce his vegetable foods. Thus
time was available, when the incentive was supplied, to produce crops which could be sold for cash.

241 The introduction of new tools has not, however, had any marked effect upon the methods
242 by which a New Guinea villager produces his food crops. Long ago he discovered by experience what agriculturalists have later discovered scientifically, that tropical soils when exposed to the sun and rain very rapidly lose their plant nutrient content (particularly nitrogen) and without the addition of fertilizer they will not sustain crop yields. In order then to make the most efficient use of cleared land, the villager plants his swidden with a variety of food crops, mainly tubers, which, maturing at different rates, help to maintain a constant food supply. Swiddens are usually abandoned after twelve to eighteen months and allowed to return to forest. Meanwhile new clearings are made and crops planted to ensure continuity. Forest is allowed to regenerate on old swidden sites for a period of five to twenty years depending on the population density and consequent pressure upon the land. Provided that the forest cover is left for about ten years between periods of cultivation, soil deterioration does not usually occur. Under this system of land
241 use, which can best be described as one of
242 shifting-field agriculture, the average land requirement is a quarter of an acre per head per
311 (P.1-B)

241 242 311 year. Thus, over a ten-year land-rotation cycle, approximately two and a half acres of land are required to support one person.

241 433 177 [437] The major change that has occurred in New Guinea agriculture with the coming of white men has been the introduction of cash crops. When Europeans first arrived they found a subsistence economy. Some trade was conducted but it was almost entirely by barter and was confined in the main to items of ceremonial value, shell and feather ornaments and the like. The early administrators, both British and German, were faced with the problem of rapidly easing the financial burdens their colonies imposed on the mother countries. The only readily apparent way to do this was to encourage the production and export of copra, the dehydrated meat of mature coconuts which grew prolifically in all coastal areas. Accordingly villagers were encouraged to produce and sell copra to itinerant traders; this village or 'trade' copra was the mainstay of the colonial economy for many years until production from large scale plantations was built up. First coconuts, then rubber, coffee, and cocoa and latterly tea and pyrethrum were grown on plantations owned and managed by white men who directed gangs of indigenous labourers in the tedious tasks of keeping the jungle at bay and processing the crops. Since 1950, Administration policy has changed in favour of encouraging the production of tree crops by indigenous growers on small plots of village land or, in certain areas, on small plantations of ten to forty acres. This policy has brought into sharp focus the difference between our land ownership system and that of the New Guineans.

423 Flying over New Guinea and looking down on vast areas of trees or grassland, with no apparent occupants apart from an occasional village, one may be tempted to think that there is a great deal of vacant or unclaimed land. This would be erroneous. Some indigene claims rights to every square foot of land under 7,000 feet and to much of the higher land as well; in many areas the rights claimed by one man are disputed by several others.

The European concept of individual land ownership must be discarded when considering New Guinea custom. Similarly the phrase

[P.2-A]

602 Kinship groups are of major importance in
the functioning of village society in New
[619] Guinea. Every individual is a member not
only of a parish but also of groups of closer
[614] kin, a clan, and maybe a lineage. Lacking any
[613] system of payment in cash for services rendered,
602 the villager obtains the assistance of his
relatives for heavy work such as the felling of
464 big trees to make a swidden, dragging a canoe
476 log to the beach, or making a long seine fishing
net. Obligations thus incurred are met
either by reciprocating when asked or by
making a gift. The kinship group provides
602 social stability and in practice the pattern of
311 land use is frequently decided by the senior
members of the group. The planting of food
● 241 crops by any member, even on land to which
he does not control cultivation rights, causes
no concern because rights to temporary usage
may be easily granted, but the planting of
tree crops, which may remain in the ground
from thirty to eighty years, is a different matter.
Planting tree crops is tantamount to
alienating the land for at least a generation
and very often some members, at least, of the
kinship group object to such long-term use.
Even if they do agree to an individual member
planting tree crops, there is almost always
the assumption that he must share any profit
he makes with other members of the group.
Individuals who have planted cash crops under
these conditions generally become discouraged
when they see the fruits of their labours being
reaped by kinsmen who contribute little or
nothing towards production.

657 In its attempts to stimulate production of
cash crops by indigenes, the Administration
423 has approved a series of land tenure laws, the
177 last and most radical of which was passed in
1964 providing for the registration by indigenes
of individual freehold title to land: a
measure designed eventually to establish a
European system of land tenure throughout
the Territory. In the meantime, such measures,
[578] by pitting traditionally conservative
people against the products of modern Western
education, are a cause of internal conflict
within indigenous society.

632 The establishment of towns, unknown before
177 the coming of Europeans, has forced an
even more drastic adaptation than have the

[P.3-A]

614 No male member of a Yega clan has any rights
423 whatsoever to land outside the consolidated
block of parish territory. All Nasioi, on the
000 other hand, are members of widely dispersed
matrilineal clans. Many of them, both men
and women, have rights to cultivate land far
from their village of residence. For a Nasioi,
the focus of loyalty is not the clan as a whole
but the small segment of it with which he (or
she) is intimately associated, in the parish
where he lives.

177 The degree to which contact with Europeans
has affected each group differs greatly.
The Northern District of Papua where the
[245] Yega live is the scene of recent rapid development
in cocoa planting by both Europeans
on large plantations and by indigenes
241 on small-holdings. The Yega are a relatively
well-educated group of people but they have
433 a record of failure in the production of cash
crops. Many of the younger Yega have therefore
[464] left the parish territory to work for wages
in skilled and semi-skilled jobs in the towns.
000 Fewer Nasioi go to work in the towns but
many have worked locally as plantation
labourers. Recently copper has been discovered
within their territory and now many men work
for the mining company which offers higher

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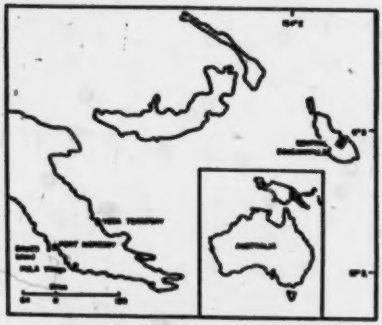

Fig. 1. Location of the three case studies

[P4-A]

LAND TENURE

614 Each clan controls some areas of mature rain
forest, some of secondary forest, and some of
423 grassland. Only the secondary forest is regarded
as valuable garden land. The mature
rain forest is potential garden land of the
future, and grassland is unimportant, except
for hunting. Clan land-holdings are fragmented
within the confines of Yega territory. This
pattern can be explained partly by the social
system of land use and partly by the history
of Yega expansion inland from the coast. The
613 members of different lineages belonging to the
same clan normally combine to clear areas of
476 rain forest by communal labour. When the
423 work is completed the land is divided among
the lineages which helped clear it. This is
614 the origin of the pattern of large continuous
strips of land belonging to one clan, but
423 sub-divided amongst the sub-clans and lineages
[613] of that clan as shown in Fig. 3. The
commonly elongated shape of clan holdings is
the result of continuous clearing in one direction
by a group of kinsmen talking and joking
as they worked and thus keeping close together.
The small enclaves of land shown
614 within the general Kurou clan area but belonging
602 to other clans (Fig. 3) may be explained
by affinal relationships. At various
423 times the Kurou men cutting down the forest
gave permission to some men of other clans,
who had married Kurou women, to work with
them. These affinal kinsmen thus acquired
[428] cultivation rights to small pieces of land,
which have been inherited by their descendents.
The first areas cleared were close to
the coast; as population increased and more
land was required, the inland forests were
cut down in the manner described above.

● 241 Rights to cultivate land are controlled not
by the clans but by the lineages; in each lineage
423 the oldest member living in the parish
territory has the authority to say which land
613 shall be cleared for gardens and how the work
[614] is to be organized; fragmentation is thus reduced.
In practice, however, many lineages are
numerically small and the sub-clan head coordinates
the work of members of the lineages

[P.7-A]

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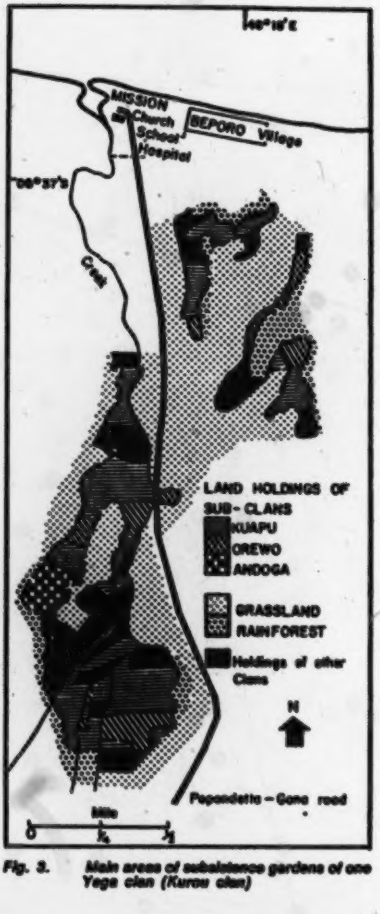
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LAND HOLDINGS OF SUB-CLANS
KUAPU
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Fig. 3. *Main areas of subsistence gardens of one Yega clan (Kurou clan)*

241 within his sub-clan so that all sub-clan mem-
423 bers may be found working land in close
613 proximity. This custom was necessary in the past for mutual protection against raiders. It

[P 7-B)

[TEXT CONTINUED ON PAGE 8-B]

241 is maintained today because, the Yega say,
423 it makes the work lighter if you have someone
613 to gossip with, and to share a watermelon or
a smoke during rest breaks. The effect is that,
at any one time, many people of a sub-clan
are using land to which they do not hold cultivation rights.

241 The granting of temporary rights to plant
423 a food crop is normal procedure. A right-holder
[602] frequently grants such rights to affinal
kin of a different clan or even to an affinal
[614] kinsman from a neighbouring parish. An outsider
granted such a right would *never* consider
[431] that he had any permanent right to Yega
land. He would simply give the right-holder a
[426] gift or, if asked, would lend land in return.

226 The Yega are coastal people and expert
fishermen. Fishing is an exclusively male
[462] occupation and fish have always been an
important food. Eleven reefs are known by
226 the Yega to exist off their strip of coast; rights
423 to fish over these reefs are held by the clans
whose ancestors first discovered them. Any
614 person who catches fish over a reef belonging
[431] to another clan must give a gift from his catch
to the right-holders. Fish are caught by many
different methods but the commonest nowadays
[177] is by skin-diving with a home-made spear
gun and goggles made in Hong Kong.

SUBSISTENCE GARDENING

241 The Yega gardening routine is similar to the general procedure described earlier. The main features are universal inter-planting of a wide range of food plants and a shifting-field system which provides a continuous supply of fresh vegetable food. Some special features of Yega agriculture are worth noting. These are:

241 a) *The shifting-field cycle.* The average
length of the fallow period for twenty-one
242 swiddens investigated was 7·4 years. Such a
figure is apt to be misleading. It tends to give the impression that New Guineans are much more organized than in fact they are. Some swiddens were fallowed for as little as two years . . . 'because my brother made his garden over there and I wanted to work near him!', while others had been left as long as thirteen years . . . 'because the soil isn't very good in this place.' Human factors as well as physical

[P.8-B]

● 241
242
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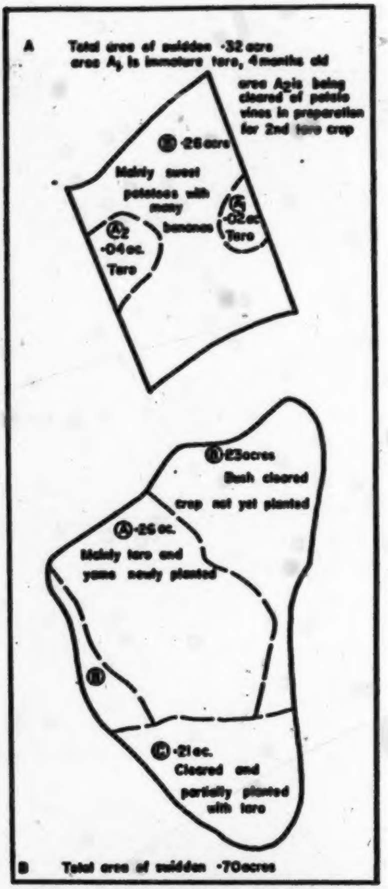
A Total area of swidden ·32 acre
area A1 is immature taro, 4 months old
area A2 is being cleared of potato vines in preparation for 2nd taro crop
B ·26 acre
Mainly sweet potatoes with many bananas
A2 ·04 ac. Taro
A1 ·02 ac. Taro
B ·23 acres
Bush cleared crop not yet planted
A ·26 ac.
Mainly taro and yams newly planted
B
C ·21 ac.
Cleared and partially planted with taro
B Total area of swidden ·70 acres

Fig. 5. *Examples of Yega swiddens, illustrating the method of maintaining continuity of food supply*

241
242 obviously play an important part in the selection of a swidden site.
[P-9-A]

●241
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Fig. 6. A Yega swidden. Notice the variety of interplanted crops which here include maize, taro, sugar cane, pineapple, paw paw, and bananas. The fence, built to keep out wild pigs, is about five feet high

241 b) *Fencing.* Most Yega swiddens are fenced,
at least partly, against the depredations of wild
pigs (Fig. 6). Since fencing is a tedious task,
natural features such as steep creek banks are
utilized as fully as possible. But frequently one
finds a swidden entirely fenced except for a
gap left purposely to tempt the pig to enter
[224] the garden. A trap is then set, or a hunter takes
his stand nearby at night. When the gap is
not being used for hunting purposes, a fire
[825] is lit or pieces of rag are hung there; pigs
scenting human beings will not then enter
the garden.

241 c) *Division of labour.* Most garden work is
performed by both men and women, but cut-
462 ting large trees is men's work only, and harvest-
ing is performed by women only. Incidentally,
the women also carry the loads of vegetables
[482] weighing sixty to seventy pounds back to the
villages, often three or four miles, sometimes
with a load of firewood and a baby on top.

262 d) *Sago production.* Sago is an important
supplementary food; it is particularly impor-
tant as a famine reserve. During an unusually
long dry period in 1965 the Yega and their
neighbours were reduced to living, for some
months, almost exclusively on sago. Production
222 is a tedious process. Sago is a starch which,
with fibre, makes up the internal bulk of the

[P.9-B)

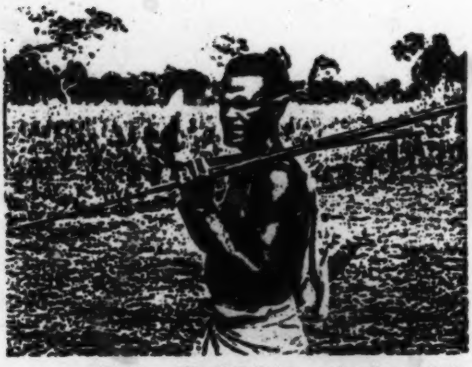

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Fig. 7. *The New Guinea gardener's work tools, an axe, and large bush knife. The strong heavy-spear is carried just in case he should see a wild pig. The cigarette, rolled with newspaper, is almost indispensable to most New Guineans* [276]

trunk of the sago palm which grows in wet or swampy ground. The sago is extracted by first cutting down the palm, then pounding up the fibre and washing out the starch. This passes through a coconut fibre screen into a settling tank. Four people can make 100 pounds of sago a day. 222 252 [461]

e) *Grass fires.* The origin and extension of tropical grasslands has long been a matter of debate. Large areas of grassland occur in Yega territory where villagers regard them as practically useless. Grasslands are extended by fire but only in special circumstances. Grassland fires seldom penetrate or destroy an area of mature rain forest or even areas of well-developed secondary growth. The danger period is the first two years after a swidden is abandoned. At this time there is a large quantity of grass and undergrowth amongst the young trees. If a fire spreads from adjacent grasslands to this highly inflammable material the young trees are destroyed. Being immature, they have not yet seeded and further forest regrowth is prevented. This circumstance is most likely to occur on the south-west margins of grassland areas where strong north-easterly 372

178 and Samarai. They were away from home for
433 two years at a time and were not accompanied
464 by their wives and children. Since the war they
466 have not returned to indentured labour but
have tried other ways of earning money.

The first such experiment was an agricul-
474 tural co-operative, originated by a returned
● 241 soldier who got the idea from one of his
wartime Australian friends. Anglican Mis-
[177] sionaries sponsored and directed the scheme
[797] and some money was made from cash crops
of sweet potatoes, peanuts, and rice. However,
when the money was shared amongst all those
participating, it was a very small return for
the amount of work and there was widespread
dissatisfaction. The scheme was finally doomed
to failure by two events—the permanent return to Australia of the mission organiser in
January 1950, and the death of the Yega leader
in the Mt Lamington volcanic eruption in

[P.14-B]

474 January 1951. The failure of this scheme
emphasises the important role of the individ-
241 ual leader in any innovation in New Guinea.

An important modification to the residen-
474 tial pattern resulted from the Agricultural Co-
177 operative. Not only was co-operation practised
in the gardens but co-operative theory was
571 preached as a Christian ideal in the churches
and taught in the schools and training colleges
797 of the Anglican Mission. The teachers em-
phasised the practical advantages of living in
a large community; for example, co-operative
labour could be easily organized, social clubs
could function more readily and school,
church, and hospital would be more readily
accessible to the majority. Most Yega accepted
361 this view and, during 1953, many of them re-
177 built their houses in a planned rectangular
village, Beporo, close to the mission station
(Figs. 4, 12). Here there was a tendency for the
361 household heads of each clan to group their
dwellings together and to maintain the same
177 inter-clan relationships as had existed in the
571 smaller villages. Nevertheless, there was a
breakdown in the previously tight social con-
614 trol over the location of dwellings. Some men
602 exercised this freedom by building away from
their clansmen but near to their wives' kin and
in some instances even sharing a dwelling with
them.

Since 1960, seven new inland villages have
361 been established along the road leading from
Gona mission to the town of Popondetta. This
movement inland from the coast was initiated
361 by the development of a cocoa-planting pro-
245 ject which is without doubt the most signifi-
cant change in land use to have occurred yet.
(311) In 1960 the old wartime road between Gona
[491] and Popondetta (actually the last stage of the
Kokoda Trail) was re-opened by the efforts of
[797] the Anglican missionary living at Gona. It
gave access to land at Ononda which in the
opinion of the District Agricultural Officer
(DAO) was suitable for cocoa. As the Yega
245 had previously made enquiries about planting
654 cocoa, the DAO now advised them to clear a
large area of rain forest and plant their cocoa
in a continuous strip, which would then be
sub-divided into individual blocks, rather than
in the small scattered plots which is the usual
pattern of indigenous cash crop plantings.

[P.15-A]

121 these changes have had on the physical environment, especially topography and natural resources.

Section 2: Climate

132 The temperature varies between 70° and 90°F. throughout the year, both in Sivepe and Inonda. The Inonda people think that the nights at Sivepe (and on the mountain generally) are rather cold and it is true that in Inonda night temperatures are noticeably higher. The temperature also fluctuates slightly with the season, being higher just before and during the wettest season, i.e., from [821] September to February. The Orokaiva like the sun to shine strongly. They think a strong sun heals the sick and they like working in [789] the sun. One recurring theme in spells to improve the growth of taro is that the sun should shine strongly. This puzzled me a little at first, but students of swidden agriculture seem to be agreed that the fertility of the gardens depends considerably upon the dryness of the weather during the period when gardens are cleared and the felled vegetation burnt. (See, for instance, Geertz, 1966: 22-23.)

Rainfall varies considerably from place to place, month to month and year to year. I have quoted some data, for Popondetta and Awala, extending over a number of years. Inonda rainfall is somewhat below that of Popondetta; Sivepe rainfall is significantly higher than at Awala. Thus Inonda usually gets 80 to 90 inches of rain per year while Sivepe gets at least 200 (Tables 3 and 4). Europeans tend to divide the year into a "wet" and a "dry" season. [821] This is not a very accurate division and Orokaiva do not use it. It rains some days in every month and the notion of a dry season can be arrived at only statistically; it will then be seen to fall in June-August at Awala and Sivepe; in May-September at Popondetta and Inonda. This dry period, for the Orokaiva, is the clearing ●[241] and planting period par excellence. The Orokaiva know that the best harvests occur if it rains little during this operation. They may not be able to explain this by the fertility gained from the ash (they think it is the sun that gives the fertility during planting) but one does notice a certain sense of urgency at this time of year to attend to clearing and planting.

In October the heaviest rains begin and this is the period 132 when crops grow fastest. Thus the crops planted during the dry 241 period are apt to develop particularly well while crops planted earlier are able to mature. It is true that planting and harvesting continue for most of the year but the rainfall variations do influence the yield of taro planted at different seasons; hence the Orokaiva do have a clear notion of optimal seasons for certain operations. The dry period is the optimal planting period, while the months preceding are the period of optimal harvest.

241 221 Food must be planted at most periods of the year as most Orokaiva crops cannot be stored, but there is a difference according to the purpose of the plantings. Seed planted outside the optimal period can be grown for no purpose except subsistence; plantings made in the optimal period may be in preparation for feasts. Their purpose is not only subsistence but also abundance. The Orokaiva calendar contains a specific feasting season which immediately precedes the "planting" season. Taro planted between July and September reaches maturity between April and June. This is the season of feasts and abundance.

241 221 924 A distinction must be made between the ideological and the statistical work calendar. The latter has been set out here from data collected by Waddell (n.d.) in Sivepe and shows that at no period agricultural activities are confined to one particular phase of the work, such as planting or weeding or cultivating or harvesting. There are, however, clear fluctuations showing an emphasis on planting during certain periods and on harvesting, etc. during other periods (Table 5).[A] The ideological calendar, as given to us by informants, both in Sivepe and Hohorita, distinguishes seven phases related to the annual cycle of three forest trees. The calendar noted by Crocombe in Inonda (1963: 6) though more summary, follows the same principle, while differing in some minor details.

1. When the garepa flowers, the taro should be ready to harvest. (The reference is, as in this whole calendar, to the main taro harvest.) But this flowering has several phases: the flowers are first white, later yellow, finally bloodred. When some of them are bloodred, the taro is "really" ready. This is the time when small feasts are given for the owner of the land, but not yet big feasts, for it is only the first of the crop that are really ready.

2. When all the garepa flowers are bloodred, feasting time has really started. This is, in the Mount Lamington area, around Easter time.

3. Another sure sign of the approach of the feasting season is the ripening of the tauga nut (called hauga in the Sangara dialect). While garepa is watched during the time of shortage before the main harvest, tauga is watched during the time of plenty. The nuts are plentiful, delicious and rich in first-class protein.

4. At the end of May, about two months after the beginning of the feasting season, white flowers appear on the barambu tree. This is a sign that the seeds should now quickly be planted in the land. The dry period is beginning; the period when clearing and burning can be done with the least loss of fertility. As these flowers appear, feasts will still be in progress in the villages, but the old men will begin to make moralistic speeches that feasting should now be over and people should return to garden work.

5. Soon after this, perhaps a month later, the leaves of the tauga begin to fall; it is good if by that time a good deal of

[A] [See Cat. 116, pp. 209-210--Analyst]

241 planting is already completed for when the old people see the
221 tauga leaves drop over the newly planted gardens they say that the
taro will have good leaves; their virtue is said to come from the
824 tauga leaves that drop. The driest part of the year is now at hand
and few taro shoots suitable for planting are developing; hence,
the best planting time is past.

[132] 6. The flowering of the tauga announces the beginning of the
rainy season. This falls around the beginning of October.

7. At about Christmas, immature tauga nuts begin to fall from
[789] the trees. This is the beginning of the time of shortage and also
the occasion of some further garden magic to encourage the swelling
of the main taro crop. Some minor feasts occur around this time.
People then begin to look forward to the time the garepa will flower
again.

We may compare this with Waddell's statistical data, which
241 compares man-weeks spent on all types of activities in Sivepe over
the periods 3 February-3 May, 1964; 20 July-6 September, 1964; and
9 November, 1964-3 January, 1965. His figures do not rally particularly closely with the idealogical pattern set out by informants and he explains this by an untypical rainfall pattern in 1964; it was unusually dry.

Rainfall fluctuations have a profound effect on the yield of the main crop taro. Because of the porosity of the ground, very heavy rainfall is needed to ensure a good harvest. Feasts can be held only in years when the rainfall has been good and the harvest accordingly abundant. In other years people are close to starvation level in the months before the harvest. It is then they rely on supplementary crops such as sago.

In recent years, two further calendars have become superimposed
805 upon the traditional one: that of the Christian festivals and that
[439] of the European economy, notably monthly coffee sales from June to
December and the payment of Local Government Council tax supposedly
[651] in September.

Section 3: Topography

In this section I shall specifically describe the differences
121 in topography between Sivepe and Inonda, but this description will illustrate at the same time the fundamental differences between the ecological base of Orokaiva mountain settlements such as are found on the slopes of Mount Lamington and of the plains settlements found North and East of the mountain. I have drawn my data from a regional land and soil survey done by the Commonwealth Scientific and Industrial Research Organization in 1954, as well as from remarks of Crocombe and Hogbin (1963) and Rimoldi (1966).

133 Sivepe lies on an altitude of 1,300 feet, seven miles from
Mount Lamington. Although the mountain rises to a height of 5,634
[361] feet, most present settlements are on the lower slopes, rarely very
much higher than Sivepe. A wide range of annual and perennial
[241] crops, including taro, on which the Orokaiva depend, do not grow
well at altitudes much above 1,500 feet. Thus, the eruption has
[931] had no appreciable permanent influence on the location of village
sites. The restricted area is at present a circle of two miles'
[361] radius from the crater of Mount Lamington; there are not now, nor
were there before the eruption, permanent settlements closer than
four miles from the crater.

The Sivepe terrain (if I may borrow the terminology of the CSIRO report) is characterised by a gentle radial slope on wide planar ridges between the larger steep-sided streams flowing from Mount Lamington into the Kumusi River. Numerous smaller creeks, together with these streams, form an effective fine-textured radial drainage system. Drainage is facilitated, moreover, by the extreme porosity of the soil.

134 Sivepe (see Map III),[A] is on a soil association of the Awala
land system which has an 8 to 12 inch very dark brown topsoil.
Chemical tests suggest that these loams are fertile, rich in
nitrogen and phosphorus. The fine-textured subsoils range from 10
[823] to 22 inches in depth. Rimoldi points out that this dominant soil
type, which the Orokaiva call mume (a word whose principal meaning
is night, darkness), is only one of five found in the district and
distinguished by Orokaiva by colour, texture and moisture. The
others are hohori (red), which is popular for cultivation if it is
not sandy; gindiri (stony, with high sand fraction); pugu (clay)
and pegara (swamp). Mume is the most widely used soil for gardens.

133 In contrast, Inonda (see Map IV)[B] is no more than 200 to
300 feet above sea level. It lies partly (to draw on the CSIRO
report again) on the flood plains of the Girua and Sambogo rivers
and partly in the moderately sloping foothills of the northern
side of the extinct strato-volcanic Hydrographers Range. The
Sambogo and Girua Rivers flow in a northerly direction draining
from the Hydrographers Range and Mount Lamington respectively.
They are swiftly flowing, rocky-bedded rivers which, together with
their numerous tributaries, give the area a moderate to good
drainage system. To the east the drainage system in the vicinity
of the Embi Lakes has been blocked by recent volcanic activity and
drainage is much poorer. A vast coastal plain between 20 and 30
miles wide stretches north-westwards from the Hydrographers for
over 60 miles. Inonda lies at the southern end of this plain,
about 15 miles inland from the coast.

134 Crocombe and Hogbin classify Inonda soils on the basis of
five soil associations listed in the CSIRO survey: (i) the
Popondetta Association, with black to very dark topsoil underlain
by yellowish-grey volcanic sand subsoil. The topsoil looks like

A [See Cat. 116, p. End Map 3--Analyst]
B [See Cat. 116, p. End Map 4--Analyst]

134 the *muma* of Sivepe, but it is far shallower, less well drained and covered with kunai grass (predominantly *imperata* sp.). It is not [241] used for gardens because of the difficulty of freeing the ground from grass roots. (ii) the Girua Association: coarse textured, recent riverine deposits lying beside the Sambogo and Girua Rivers. This soil, called *tumana* is the favourite gardening land. (iii) the Warisota Association: recent, well drained medium textured clay loams, becoming fine textured with depth and found on the Hydrographers foothills. They are grey to grey brown, and are called hora or *hohori*. They are not favoured (though occasionally used) for gardens, as they tend to dry out during the dry season, which is much longer and dryer than at Sivepe. The other two soil types are too stony or sandy to be used for anything except foraging and hunting.

162 There is a striking difference in population density between the two districts. Sivepe, with a population of 137, occupies and 161 owns about 0.75 square miles of land, an average of about 180 persons per square mile. We may compare this with Inonda, with a population of 45 and about four square miles of land--an average of 11 persons per square mile. Sivepe is not at all untypical for the Saiho Census Division in which it is located; this is the division which includes the Mount Lamington foothills as well as some sparsely populated areas in the vicinity. Average population density in this division is 75, with local densities of 200 and over "not at all rare" (Rimoldi, 1966: 4). Inonda also has a population density characteristic of the census division in which it is located; the Buna Division is occupied by about eight persons per square mile (see Table 6).

Rimoldi's analysis shows that the Sivepe population density 161 is close to the upper limit the land can sustain with present 311 technology and social organisation. The sample he chose for study (50 persons of the Jegase and Timumu clans) happened to have less land than the average, namely a total of 138 acres. He showed that of this area, 110 acres are required to maintain present standards of subsistence agriculture (1966: 20-21). This leaves hardly any margin for land unsuitable for cultivation and for unequal distribution of land as between families. It also makes little provision for a balance of forest land which must be preserved, as forest resources are essential for the maintaining of the Orokaiva economy. It is true that the other major Sivepe clan (Seho) has greater land resources, and that the Seho people allow the others to use forest trees from their land for building and other purposes. Nonetheless, land resources are almost as tight as they can be.

In contrast, Inonda has plenty of room. When Sava Village joined Inonda after the eruption, there was plenty of garden land for everybody. Crocombe and Hogbin claim that 560 acres may be classed as good garden land, whereas the present level of subsistence gardening can be maintained with 127 acres (1963: 10).

361 cultivating gardens that are more than a mile or so away from his
village.

When Rimoldi made his careful notes of cultivated gardens,
241 these seemed to be predominantly in the Northeastern part of the
311 village domain. These gardens are ordinarily fallowed for eight
years or so and then cultivated for one season. The gardens in the
Southwestern part of the village domain were undoubtedly being
cultivated shortly after the eruption; they are again being cultivated
today. It therefore seems to make sense that after the eruption
people were living in Pamba, in that part of the domain and that
the new Sivepe is again in that area.

731 Inonda experienced three shifts since the eruption: first
to the vicinity of the airstrip (1951), then to the village
361 described by Crocombe and Hogbin (1955), then to the village where
I myself stayed (established 1964; see Map VII).A The pre-eruption
village was just behind this new village, again suggesting an
orderly exploitation of garden land. In 1964, Inonda returned to
garden land that had been fallowed since the eruption. People told
me that before shifting to the present site, they had to walk much
too far to their gardens.

361 While the layout of Pamba was traditional--with the houses
close together and little space between the rows--both post-eruption
659 settlements of Sivepe and all the four post-war Inonda settlements
followed what one may call the Australian standard plan: two fairly
regular parallel rows of equidistant houses facing each other, with
a few houses joining the two rows, thus forming a quadrangle, and
a wide field in the middle, used for playing soccer and basketball
and as a separation of the two "halves" of the village which tend
[364] to belong to different clans. A modern village will contain, in
addition to residences, privies for each family, while some have
[345] built a hall for the women's club, sponsored by the government.
Inonda built a very stylish one, using as a floor a slab of concrete
[575] which the Americans laid down during the war. Sivepe got no further
than the foundations, after which a quarrel blocked progress. In
addition all villages contain a number of arara or jataka--covered
platforms where men sit and receive visitors. Many villages, including
[591] Sivepe, still have a bachelor's house. Typically, each house is
occupied by a two-generation family comprising no more than one
married couple. A stream is always close to the village.

The change in village layout as between Pamba and the two
later Sivepe villages must be discussed in a little more detail as
the eruption was clearly influential here. The Australian government
has long been concerned about village layouts; this interest went
beyond consolidations and included the improvement of housing
657 standards, village sanitation and roads. We find Wilfred Beaver,
in the Annual Report for 1914-15, already claiming that he had
364 "insisted on these three essentials in village life," in the

A [See Cat. 116, p. End Map 7--Analyst]

231 they marauded gardens, so that I assume that a good number could
be rounded up if Sivepe were to hold a major feast. They were not
at all accessible, however, and none were caught during such hunting
[422] expeditions as the people organised. On the occasions when marauding
pigs were shot, the pigs were always recognized and presented by
the killer to the owner who then presented his pig to some other
person. No doubt these pigs were a resource and perhaps I was at
fault for not taking a census, but with no pigs visibly in evidence,
I considered these assets as too shadowy. In Inonda, where Crocombe
and Hogbin reported 12 pigs in 1962, only two were left in 1966.
235 My prognosis for pigs as an economic resource is poor. The fowl
population, on the other hand, had remained very much as it was at
[262] these earlier investigations: eggs were discovered and eaten
occasionally, but the use of the fowl was for feasting when visitors
[239] had to be entertained. It was also noticeable that the roosters
were deprived of many of their choicest feathers at a time when
[295] headdresses had to be refurbished for dancing or spears decorated.
At a visit from Togahou, which by traditional etiquette, as I
[411] understand it, should have rated at least one pig, the people of
[579] Sivepe killed only fowls. This was, I was told, because there
were no pigs available; hence the fowls were a proper substitute.
It would seem that the fowl is rapidly becoming the substitute for
the pig on many ceremonial occasions, though not yet for all
occasions.

There is a great shortage of both pigs and fowls for these
438 ceremonial occasions. Pigs are bought for high prices ($20 to
439 $30)--from neighboring villages and even, as Crocombe and Hogbin
say, from European planters. Fowls tend to be made available on
[435] big occasions by whoever has them so that their number does not
increase--a few dozen in each of the two villages.

We may distinguish, among local plant resources which yield
241 economic products, those plants which are native to the district
311 and those which have been introduced by Europeans for cash cropping
purposes. Starting our survey with the former of these two
categories, we shall deal first with food plants and next with
economic trees. I have tabulated average food plants per household
as shown for Rimoldi's Sivepe sample and as shown by Crocombe and
Hogbin for Inonda (Table 7).[A] The pattern for the two places is
remarkably similar except that sweet potato is a notably more
important crop at Inonda than at Sivepe. The reason for this is
that it is more dependable under drought conditions such as often
occur at Inonda and also, it seems to do better at Inonda. The
fact that the Inonda taro acreage is higher than the Sivepe acreage
reflects no more than the higher yield per acre in the latter place.
There is no evidence that any major change occurred in the quantities
grown or the methods of cultivation over the period with which we
are concerned, though a small increase in the consumption of
Xantosoma taro may be a symptom that people may be starting to

[A] [See Cat. 116, p. 212--Analyst]

241 devote less time to the cultivation of the more laborious (but more
311 favoured) Colocasia taro.

During the post-eruption period there have been, as we shall
[433] see below, many pressures on the Orokaiva to reallocate their
working time, by raising the standard of village building construction,
by taking on outside labour to raise taxes and buy luxuries, by
increasing the acreage in cash crops. In many cultures dependent
on swidden agriculture these pressures have led to more slipshod
methods of cultivation, or smaller plantings or shorter fallowing
periods. Among the Orokaiva, the only effect so far has been, in
all probability, a decline in the surpluses grown for feasts. This
is a change to be discussed later and related to religious changes.
In Sivepe there would clearly be a danger, if cash-cropping was
expanded to the extent some administration officers would like to
see, that fallowing periods in subsistence gardens would need to
be shortened. There is no evidence that subsistence gardening, so
far, has been affected by cash cropping, as both the acreage and
the time devoted to cash crops is too small. (For details of time
allocation to activities in both villages, see Table 8.)[A]

245 The average Sivepe family, according to Rimoldi, has 62
cultivated trees of local origin from which crops are gathered in
season. No corresponding figure is available for Inonda, but it
would be about 30. The list of most important trees varies a
little between the two districts because of differences of climate
and soil.

Sivepe	Inonda
Coconut	Sago
Breadfruit (oga and eumba)	Coconut
Betelnut (areca)	Betelnut
Sago	Hauga nut (tauga)
Pandanus	Breadfruit
Tauga nut (cycas media)	Pandanus
Puga nut (terminalia okaria)	(Ajimo)
Bark cloth tree (ajimo)	
Mango	

An important difference between the resources of the two
villages is that coconuts at Inonda will yield copra; hence, a
copra drying house was built and this has been and can be a source
[262] of income. At Sivepe, the flesh is thinner and coconuts are grown
for drinking, cooking, feeding dogs and chickens, while the nuts are
also eaten regularly and form a useful source of protein. Another
249 difference is that neither betelnut nor tauga and puga do well at
all in the Inonda district and quantities are negligible. The lack
of betelnuts is felt very strongly, as the Inonda people are as
276 fond of chewing it as other Orokaiva. Hence, it is usually obtained

438 A [See Cat. 116, p. 213--Analyst]

276 from relatives who live in the mountain districts or else obtained
438 by barter, or bought from other villages or at the Popondetta
market.

245 Sago is made and eaten when other crops fail, but the plants
are also used as building material. As the supply of sago is very
[262] limited in both villages, the plants are highly prized. Inonda
people owned only 21 trees so that the bulk of supplies was obtained
from other areas, e.g., from wild sago trees over which they claim
rights. In Sivepe, the total supply is in the vicinity of,
probably, 300. This suffices for the local need, both as an
occasional supplementation of the food supply and for building, when
a great quantity is needed.

[799] The special position of sago among economic trees was shown
clearly in Miss White's description of the building of Sasembata
mission station shortly after the eruption. This was a big project
in which all the surrounding villages (including Sivepe) collaborated.
Labour was given free and so were all building materials--apart
from sago for which payment was expected and made. I was told by
informants this was because sago is a cultivated, not a bush tree.
During my field work period, the mission again needed sago roofing
for expansion and repair of buildings, but this time no payment
was made. However, each household was asked for a contribution of
only two strips of roofing. Thus, it was again treated as a
resource of special value as other materials were not supplied in
such strict rations.

The ajimo tree, used for manufacturing bark cloth was not
reported in Inonda by Crocombe and Hogbin but we did find a small
[287] quantity growing. Though bark cloth is only used for dancing
costumes nowadays, in both villages, these dances still take place
from time to time. The women's clubs have stimulated the production
of painted bark cloth for sale, but this has not led to extra
plantings. Sivepe's supply of ajimo trees was only one or two
for most households, sufficient for an occasional festive garment
with none to spare, but there was an abundance of ajimo in some
other villages in the Sasembata district. Here we may notice a
definite change between the pre-eruption period and the present
at pre-eruption Inonda and because at Pamba, bark cloth was still
the daily wear for everybody, so that the ajimo was an important
economic tree. With this exception, there would seem to have been
no change in the resources of economic trees of local origin.

241 The three introduced cash crops of significance in the two
villages have been rice (pre-eruption), coffee and rubber; in
177 both villages, one man grew a little cocoa. These industries,
which developed in intensive interaction with Australian authorities,
are perhaps better discussed in detail in a later chapter when these
[243] relationships are analysed. Rice plots were developed in the period
between the second world war and the eruption; the plots in both

241 villages had to be abandoned at the time of the eruption and rice
177 growing was never resumed. The growing of rubber by Orokaiva in
the Northern District has a long and somewhat unhappy history which
[243] will be referred to later; at the time of the eruption, just before
the Korean War drove up the prices, the rubber trees planted by
249 the Orokaiva were hardly harvested at all; Rimoldi reports that
311 in 1963 the existing stands at Sivepe were tapped to some extent
and the coagulum sold to a factory at Awala. There were six tappers
177 in his population sample of 50, who together earned $70 in one year.
[434] When I began my field work, the tapping had ceased as the factory
was no longer buying indigenously grown rubber, but a rubber
[474] cooperative was set up early in 1967, with the encouragement of
the Department of Agriculture, in a village about one mile from
Sivepe. The Department of Agriculture was also encouraging the
people to plant superior Malayan rubber trees and two men had
planted 250 and 72 trees respectively. Rimoldi reports that
"members of the clans now represented in Sivepe and Binduta"
owned four plots ranging from less than half an acre to about
three acres in area.

Since that time, however, a new plot has been established, four and one-half acres in size, on which theoretically seven men were to establish rubber stands. The Malayan trees were planted here, as well as self-sown trees from the other plots which were dug up and replanted. These plantings occurred shortly after Rimoldi left. If the new cooperative venture succeeds, it is likely that the new plot--most of which still remains unplanted--will be exploited, but people were clearly waiting to see whether sales at attractive prices would eventuate.

Orokaiva coffee plantations are wholly a post-eruption
245 development, inaugurated by the Agriculture Department shortly
177 after it was set up in Popondetta and greatly strengthened by the
311 setting up of a coffee cooperative, first under the Higaturu Local
Government Council and later independently. First plantings in
Sivepe were before 1954, in Inonda in 1955. Rimoldi reported that
in 1964, there were 1,100 coffee trees in Sivepe, owned by five
growers. Crocombe and Hogbin reported 801 trees in Inonda in
1962, owned by three households. Since that time, Inonda has not
added to its plantings, but Sivepe, along with the whole of the
Saiho Division, has greatly increased its cash-cropping activities
[434] since the 1964 census. The number of growers has increased from
five to 14--every able-bodied man in the vigor of life has his
coffee garden from which he derives an annual income of between
$50 and $100. This increase is the result of vigorous encouragement
of plantings by the Agriculture Department, a change of ideology
under the impact of the Local Government Councils and a great
improvement in the marketing arrangements. In 1966, Sivepe coffee
was collected and promptly paid for in Garombi village, about 15
minutes' walk from Sivepe. I did not take another coffee census

177 part of village layouts, are a blend of Papuan tradition (the Orokaiva
have always been very fond of flowers and planted ornamental shrubs)
[351] and a new Australian-derived passion for military regularity. This
[363] is evident especially in the emphasis placed on building the houses
in a line, and equidistant; the shrubs are also rigidly in line.

The changes are to some extent due to the experience of Ilimo
177 camp which is reflected in the style of Old Sivepe. The changes found
342 in New Sivepe are due to subsequent influences, mainly that of the
Local Government Council. Once village improvement became an ideologically
validated objective, the way was open to the adoption of
further innovations borrowed from the Kokoda district, such as the
use of "timber." I did not see "timber" used East of the Sasembata
district.

[182] It may well be that the increase in house size, coupled with
the present need to build a large number of houses in the same year
to form a major modern village, would rapidly have led to a critical
shortage of sago in Sivepe if people had continued to use this material
for walls. Thus, the present practise of using timber instead of
sago could well have an economic explanation. Sago roofs can be
built without destroying the plants, whereas plants have to be cut
entirely to produce sago walls. I was not, however, given an economic
explanation for the change-over to timber; I was told only that it
was better-looking and provided good protection against wind and rain.
But nobody would say anything against sago; sago walls are "also very
good."

177 *Tools and skills*: Traditional agriculture has undergone considerable
change, as elsewhere in New Guinea, by the introduction of steel axes,
241 bush knives, grubbers etc. Thus the preparation of the soil for
[412] gardening has been greatly facilitated. There has, however, been no
change in the operations concerned with the plants themselves, planting
and harvesting being done with wooden digging sticks. Many of the men
have had experience in rubber plantations, with operations such as
tapping; there are a few tapping chisels in the village. Training in
coffee cultivation occurred after the eruption, but it was not until
a few years ago that hulling machines were introduced. Every grower
177 at Sivepe has, as far as I know, only one coffee sack. The basic
skills needed to bring rubber and coffee to market have been mastered,
245 but up-to-date techniques for improving the yield of the trees have
249 not been mastered. The difficulty, in this respect, is not purely one
of communication, as men who have been employed as rubber tappers must
be familiar with certain rules regarding care of the trees which are
definitely not being practised. Similarly, I doubt whether one can
explain failure, on the part of Sivepe growers, to prune their coffee
trees by ignorance of pruning techniques. The true explanation would
appear to be a lack of confidence that the rules make any difference
to the yields. In Hohorita people began to prune their coffee trees
when they discovered they were then *easier* to harvest. But the whole
pattern of reasoning upon which Western horticultural practises are

654 The rubber plantings followed a quota established for each village;
177 in practise, a village man would make one of his garden plots available
to the community at large and all the village trees would be planted
571 there. This would be a communal work project. In accordance with
476 Orokaiva tradition, however, the product of these rubber trees would
be individually appropriated, each man being allowed to collect a
limited quantity of rubber for himself and market it. The tasks of
building the mission station and maintaining it further added to the
amount of group work required. Men who took jobs on plantations once
more found themselves in a group work situation which formed a contrast
with the earlier tradition of individual effort.

474 It is paradoxical that the Australians, after first encouraging
this group orientation, soon found themselves fighting against it, in
177 the belief that they were face to face with that dangerous phenomenon
"communism." The immediate post-war period, up to the time of the
241 eruption, was the time when an ideologically based cooperative movement
took root in the Northern District. This movement, which was centred
on Gona, has been well described in general terms by Dakeyne (1966).
[777] It was the direct result of the work of two Anglican clergymen, Revs.
Benson and Clint, who preached the virtues of cooperatives, and encouraged
the cultivation of a great many village plots of rice and peanuts
between the years 1947-1951. Dakeyne reports: "Rev. Flint was
insistent that Christian ritual be associated with co-operative
action. Educational and committee meetings always closed with a special
prayer, there were church services at which tools were blessed and
newly planted seed was blessed in the gardens. This aspect of the
cooperative movement was regarded with some apprehension by Administration
officers who felt it could be misunderstood by the Papuans and possibly
lead to the development of a cargo cult. There was some evidence to
suggest that a cult did in fact begin." (1966: 60)

The evidence, which Dakeyne does not cite, is interesting enough to be worth a brief mention. Kleekham, the agricultural officer for the coastal area at that time, reports in a memorandum (Kleekham, n.d.) that leaders of the movement were collecting taxes secretly and that "some mystical element was involved" in rice marketing. Kleekham had a huller and was willing to hull rice for growers" consumption or buy it for cash, but the people withheld their produce. He thought that this aloofness was due to the growers' belief "that the formation of and participation in cooperatives would--magically or mystically--in short time raise the native to the status of the European in all respects."

In some form, this movement reached both Sivepe and Inonda. At Sivepe, one man made a plot available where people could "cooperatively" grow rice. A deacon stationed at Sasembata, but a member of the Yega tribe where the movement had its origin, blessed the seeds and (according to my informant, allocated a section of the field to different individuals. The rice was hulled by the Administration's agriculture officer at Waseta and each man took his own rice back home, giving a

474 share to the owner of the land. This activity started some time after
177 1947 and ceased with the eruption of Mount Lamington. It involved
"everybody" at Pamba. At Inonda, both rice and peanuts were tried
241 out. The rice was planted in one block, without subdivisions; it
was hulled and sold at Higaturu government station, the money was
distributed. There were two harvests between the time people started
to grow rice and the time of the eruption, when rice was abandoned.
Proceeds were 18 pounds and nine pounds; people's shares were two to
three pounds each. The mission had nothing to do with the activity,
but only the government, so I was told.

The evidence, limited as it is, leads one to wonder whether
the rice produced by the cooperatives was really unsaleable, as Dakeyne
suggests (1966: 61-62). On the other hand, there is no doubt that
the mission lacked any marketing facilities and I would strongly agree
with Dakeyne that the cooperative movement could never have succeeded
except on the basis of cash sales for good prices. Sivepe, acting
under mission influence, ate their own rice and did not attempt to
sell it. When the people came back after the eruption, the rice was
"spoiled," the deacon had been transferred to another station. In
Inonda, the crop had likewise been "spoiled." Dakeyne reports that
in 1951, the rice was attached by a species of "army worm;" the
District Agricultural Officer ordered all crops destroyed.

474 The pattern of production of the Sivepe rice resembles that
of the communal yam gardens. There also, several men may plant
241 together in the garden of one of them; the users are then expected
to make a gift of yams to the owner before taking away their own. If
[427] we put this strictly in contractual terms, a man leases land to others
for one year for a fee. The lessees, together with the owner (who
retains one section for himself), club together as a kind of working
bee for the planting and harvesting (and perhaps some other operations).
This traditional pattern was revived after the eruption in the establishment
of coffee and rubber stands. Its significance, however, is somewhat
changed if such common cultivations are carried on not for the sake
of growing food for feasts (such as the yams), but for cash (as in the
case of rubber and coffee and perhaps rice). When a common plot is
established for cash crops (but not yams), the Sasembata district
people call this a "company;" they speak of "company land"--the word
"company" being a borrowed English word incorporated in Orokaiva
vocabulary. This word has mildly millennial overtones: a "company"
is the means by which the Orokaiva may acquire wealth equal to that of
[829] the Europeans. It would be unfair to say, with Kleekham, that the
"company" of the Orokaiva is a mystical and magical device; it is in
fact a representation of what Orokaiva believe European business to
be like.

471 Today, Sivepe has three forms of economic organisation. The
dominant one is that where the factors of production are entirely
[596] provided by the extended family and where the product is appropriated
by the extended family also. This sytem applies to subsistence as

471 well as cash crops. The clan or village has overriding rights to the
product only when a feast is being held; at such a time, people are
encouraged to make extra plantings and are expected to donate what
has been grown in excess to their own requirements. Such donations
are represented as "voluntary" by informants.

471 The second type of organisation is that brought about by the
Australian government's insistence on the planting of village quota's
● 241 of rubber and coconut. Here, as I explained, an undivided area was
621 planted by "all" members of the community, and the product appropriated
by individuals on a sort of roster system. The land remains owned
by the individual who made it available and it will revert to him
when the trees die off. It is only the trees that are "communally"
owned. There is no traditional precedent for this kind of arrangement.

471 The third type is that described on the preceding page. For
this system, the selected plot of land is divided into sections called
241 *tane*. This is common procedure also when subsistence crops are planted.
Each *tane* is then *lent* to a person who will plant coffee or rubber
427 there. This lending of *tane* is likewise traditional; a man described
how his sister, after a quarrel, came back to Sivepe (she had married
out) and he at once gave her a *tane* from his new garden to look after.
The only difference, in the case of tree crops, is that the *tane*
is lent out for a longer period, in fact as long as the borrower
continues to harvest the trees (regularly). No new "communal" coffee
plots of this sort have been established in Sivepe for many years;
there was, however, such a plot allocated to rubber around 1964, as
I have described. It was called a "company" and the agricultural
officer told me that the government did not like supporting these
"companies," preferring development of "individual holdings."

474 In the neighbouring village of Sasembata, where a rubber cooper-
ative was set up, a new variant developed in 1967. This was also called
245 a "company;" its main asset was a small factory for processing the
rubber. The "company" was also allocated a plot of land, owned by
a village man, where trees were planted by a work group, with the
intention of tapping and selling the rubber *for the benefit of the
company*--there was some talk of saving up for a truck to cart the
rubber and other village products. In addition, villagers planted
trees on their individual land and rubber harvested from that land
would be processed at the factory and proceeds would go to the grower.
This scheme met with some sturdy opposition from the agricultural
officer. The fear of the administration was always: cargo cults,
communism, fraudulent accounting. Four Sivepe men were actively
occupied for some weeks on helping to build the rubber factory. They
also contributed $10 membership fee. Members were drawn from all
villages closely related to Sasembata.

474 Cooperative principles were also not infrequently followed
in the setting up of trade stores. Rimoldi (1963) reported one such
443 venture, involving 11 villages and centred on the Sasembata mission
station. The savings seem to have totalled $60 from each of 12 clans,

Section 2: Economic Assistance

177 Subsistence: Undoubtedly, European contact had a profound influence
on the subsistence economy, both through the introduction of steel
433 tools and of the pax Australiana. The government did not, however,
intervene directly in the operation of the Orokaiva subsistence
economy; it was a very simple economy, but it provided, in general,
adequate nutrition and housing. The first time the Orokaiva subsistence
731 economy broke down seriously in the post-contact period was immediately
657 after the eruption of Mount Lamington. The government therefore decided
to offer some limited assistance towards the re-establishment of the
subsistence economy in the resettlement villages built when the
refugees left the evacuation camps. One requirement of the new villages
was a food supply until new gardens had been made and harvested. This
[241] requirement was met by the planting of a quick-growing variety of sweet
potato in villages in the vicinity of Ilimo camp. The government also
bought up any root crops the Orokaiva could supply and distributed
these in the resettlement villages throughout 1951, as needed.

The opportunity offered by the evacuation camps was also taken
731 to introduce a few innovations which, it was thought, would improve
242 subsistence gardening in the resettlement villages. People were taught
the cultivation of the variety of sweet potatoes mentioned above, as
well as of corn, tomatoes and beans. Seeds and plants were supplied.
An agricultural officer demonstrated on a large scale the growing of
sweet potatoes and peanuts. In order to facilitate the rapid establish-
[412] ment of gardens--which the government hoped would be bigger and better
than the pre-eruption ones--small spades were distributed to villages.
These small spades were not a familiar implement to the Orokaiva, but
the agricultural officers thought they would be more efficient than
the wooden implements and large shovels hitherto used in villages.
These small spades cannot have taken on very well; I saw none in Sivepe
or Inonda. I myself had brought a spade for the garden I established
in Sivepe, but my neighbour, upon seeing it, at once supplied me with a
grubber (ex-American army stock). A very brief acquaintance with the
root structure of the garden weeds convinced me that a spade was indeed
[227] of limited utility. Finally, in order to add to the supply of protein
in the resettlement villages, the camp superintendent distributed some
snorkels for catching fish.

Keesing reports there were fears in the camp that the eruption
731 would have destroyed taro seed stock, but this fear proved unfounded.
134 The taro plants remained perfectly healthy and the volcanic ash made
the soil amazingly fertile for awhile, so that food shortages were
quickly relieved.

Issue of Food: In the camps, rice, tinned meat, tobacco were distributed
731 according to a ration scheme based on the census figures. Each village
constable was issued with rations for the number of people resident in
657 the villages under his control. These distributions were continued in

114 kind enough to show me this study in manuscript, I shall utilise it
here. The general question with which Mr. Waddell is concerned is
464 whether earlier students of societies depending on shifting agriculture
are right in saying that such societies, at least in fertile regions,
[166] have a considerable potential labour surplus. He proceeds to argue
that, in the light of detailed data on the use of time in Sivepe, what
[167] potential labour surplus there might once have been has already been
taken up by labour migration of male adults (which, for his sample, he
puts at 37.8%). Waddell takes issue with Fisk (1962: 465) who defines
economic activity as comprising only the production of food, clothing
and shelter, and argues that, given the existing socio-economic matrix,
all the other activities listed on his time charts (see Table 5)[A]
should be regarded as economic because they buy status and security.
[412] He also takes issue with Salisbury (1962: 216-20) who proposes that
[461] the change from a stone-to-steel technology in the New Guinea Highlands
has resulted in a saving of two-thirds in the time allocated to specified
axe-using tasks and who concludes from this that a vast potential labour
surplus is thus created. Waddell shows, by a quantitative study of
the allocation of time within activities, that only 38.5% of the time
allocated to an activity is actually given over to the main task, and
even if one includes ancilliear, and other productive tasks, this
raises the proportion to less than 50% of the total time devoted to
that activity. (See Table 17.)[B] As steel implements are used for only
a portion of productive tasks, they did not, Waddell argues, make a
crucial difference to Orokaiva work patterns.

114 If at the time of Mr. Waddell's study (1964), the potential
labour surplus in Sivepe was small, how was it possible to fit in such
464 new additional activities as the growing of coffee? Mr. Waddell was
in an excellent position to discover this as at the time of his survey
461 seven of 15 households surveyed engaged in cash-cropping; he was therefore
● 241 able to inquire how this affected the time spent on subsistence food
production. As it happened, the median time spent on subsistence
gardening by the whole sample equalled precisely the median time
spent by the cash-cropping households. (12.6 hours per week, vide
his Table 5:5) It appears from the table I derived from Mr. Waddell
(my Table 17) how the cash-cropping families fit in this extra work:
they spend a great deal less time having rests and meals. While non-cash croppers allocate only 28.4% of the time within activities to
their main task, the cash-croppers allocate 50.6%. Though Mr. Waddell
gives interesting explanations which account for part of this discrepancy,
even if full allowance is made for these, the fact remains uncontestably
that the cash-croppers simply work harder.

114 Mr. Waddell proceeds to show, by a detailed psychological
assessment of the cash-cropping individuals, that they are indeed the
241 most acculturated and industrious members of the community. This
seems to suggest a considerable heterogeneity in working habits as
177 between the members of the community. The author clearly shows this
heterogeneity to exist as between the sexes and between different age

A,B [See Cat. 116, pp. 209-210, 223-224, respectively--Analyst]

114 groups, and I shall return to this aspect. In addition, however, a
considerable weight is placed upon the difference between individual
177 dispositions. I would suggest that in this respect, Mr. Waddell may
have put too much confidence in the results of a synchronic study and
241 it is fortunate that another investigator (myself) was able to observe
the community at a time when coffee growing had become a general
activity. Regrettably, I did not collect quantitative data of the
same scope as Mr. Waddell.

177 I shall anticipate later chapters by suggesting here, that
differences in level of acculturation in Sivepe never go very deep. Certainly, it is always the same minority of relatively acculturated people who are willing to risk making innovations. This applies to the introduction of European styles of clothing, of radios, kerosene lamps, sending children to school regularly, being baptised, building lavatories and also to the growing of coffee and the planting of the improved Malayan rubber trees. All these things are always done first by a few pioneers, and usually the same pioneers. The basis upon which these people become pioneers is usually a relatively shallow contact with western civilisation. Mostly, the new skills, activities and other introductions they sponsor are not so far ahead of the rest of the community that a swing of local fashion cannot make them universal or almost universal properties. There was no evidence of a widening social and economic gap between acculturated and unacculturated families; there was a gap, but it always remained small (at least, so far). The pioneers tried innovations; the conservatives held back until they saw the innovations succeed, as happened by no means always.
Then, one, two or five years later, the conservatives followed the
[461] progressives. Thus, the activity pattern Waddell observed among the
progressives is now much closer to the general norm. The people themselves feel sure that today they work harder and rest less than they used to do. The rest periods I observed were shorter than those measured by Waddell in 1964.

Nonetheless, I would support his main contention that the work
433 day of the cash-croppers of Sivepe today cannot be greatly lengthened,
461 nor productivity greatly increased, unless ways can be found to make
work more efficient by technological and other innovations. I have
241 already suggested that a degree of collectivisation would permit the
introduction of some labour-saving machinery and better transport
114 facilities. Mr. Waddell makes two further suggestions which need
brief discussion.

The first of these is interesting because it questions an assumption that has been almost universally accepted in the literature on shifting cultivation. He argues that the shift from Old to New Sivepe did not actually reduce travelling time from village to garden but in fact lengthened it. He quotes detailed figures to prove this. Village locations, therefore, are not actually being chosen by Orokaiva by criteria of economic rationality, but on wholly non-economic grounds. If this were true, we would need to re-examine whether other societies

433 of shifting cultivators actually do shift their villages to save time
as previous investigators have believed: perhaps, we need to look
461 for entirely different motivations.

241 The question is an interesting one, but Sivepe does not
provide a clinching counter-instance. Mr. Waddell's sample was taken
114 entirely from the Jegase and Timumu clans, while he did not collect
data on travelling time from the Seho clan. Now it is the latter clan
[484] which owns most of the land around New Sivepe, so that their travelling
time is (at least for most families) substantially reduced by the shift.
[423] Furthermore, five of the Jegase households (some of which were formerly
called Timumu) now have gardens very close to New Sivepe. The main
sufferers appear to be two families who migrated from Binduta recently,
whose land is mainly close to Binduta, and against whom feeling has
been building up over the last few years. Mr. Waddell is right,
however, in stressing that the major reason for the shift (as given by
informants) was the closeness of the new village to the road and the
mission station. As such the basis of the shift was practical and
ideological but I believe that overall travelling time was reduced
if both Seho and Jegase clans are taken into account. Certainly the
new village is very close to the land of most of the Sorovi people
who settled in Sivepe in 1966.

The second suggestion made by Waddell is that travelling time
could be reduced, and thus working efficiency increased by land tenure
conversion. He has in mind, I think, the arrangement already found
in Papuan returned servicemen's settlements established by the government
where each individual family is settled on its own 20-acre block and
grows cocoa and subsistence crops there. Conceivably, when tenure
conversion is completed, the Orokaiva might be encouraged to live on
individual farm holdings rather than in compact villages. Some planners
in the Territory are actually playing with this idea. It has many
drawbacks, however: distance from roads, from schools, collapse of
social control institutions, abandonment of useful social development
projects such as the provision of good water supplies in the resettlement villages.

Comparison with Inonda suggests that as the proportion of adult
males lost through migration from Inonda is smaller, and none of these
males have left dependents in the village, and furthermore, as the
amount of cash cropping work is relatively smaller, the Inonda people
are less pressed for time than those of Sivepe. This is borne out by
the fact that they are away from the village more frequently as
Waddell's statistics show.

An interesting discovery made by Waddell concerns the time
114 allocation of the elderly. He shows that in adulthood the amount of
887 productive work done decreases with age, as does also the amount of
time spent on productive work, but the amount of time devoted to social
activities and contacts outside the village declines even more steeply
after middle age. The Orokaiva has no leisurely old age. Unlike the
[888] Polynesian elder he does not become a sage, remote from economic

114 affairs, but gives all his declining energies to his garden, keeping as close as possible to the productive level of his better years. He
887 draws closer and closer to his garden where his spirit will dwell after death. Apart from the garden, he becomes remote from most things;
[888] his days of household duties, hunting, fishing, building are over. He
[775] will, however, make dancing ornaments and weapons and headdresses which again lie close to the spirit realm. (I have quoted Waddell's statistical evidence for these tendencies in Table 18.)[A]

How did culture change influence the division of labour between
462 the sexes? For the traditional productive activities, there has probably been hardly any change. I have quoted a table of exclusively
241 masculine and feminine activities collected by Williams in 1923, and
[199] hitherto unpublished (Table 19).[B] Certain tasks of importance were omitted from this list, which may explain why Williams did not publish it. Sago making was probably always a male activity; so was the use of the digging stick preparatory to planting taro and yam. The harvesting of taro was probably always a specifically feminine task; there is clearly a taboo on men against harvesting taro. Even bachelors never do it but must leave it to his mother, his sister or his brother's wife. If men did it, I was told, they would not "know how" and they would never manage to eke out the crop until the next harvest. This did not apply to the harvesting of other crops. When Williams classified "planting" as a feminine task, he was probably thinking of the actual placing of the cuttings in the ground, though I have seen men as well as women do this.

In the Orokaiva view both man and woman are repositories of
462 capacities and resources specific to themselves; the relationship
562 between man and woman is the giving of exchange (mine ari) of the contributions of each. Man views woman as an equal exchange partner and this equality is real even though the care over legal and political matters is a distinctively masculine contribution. In the new activities
[177] introduced since European contact the same balance is preserved. Some new duties (e.g., the washing of clothes) were added to the specifically feminine preserve, church work and the purchasing of goods became a predominantly masculine preserve (as is attested by Waddell's statistics). The harvesting of rubber, taught exclusively to men on the plantations, became an exclusively male activity. On the other hand, the bulk of cash producing activities (working for pay, maintaining, harvesting and processing of coffee) were shared.

One interesting observation made by Waddell and confirmed by
462 me is that most marketing of subsistence crops is done by the women
[241] whereas marketing of coffee is done by the men. The handling of harvested crops is normally a woman's prerogative. These are normally
[415] carried in large string bags which only married women can own and hang over their heads. While the casual European observer supposes that the
[482] women carrying these large bags are reduced to the status of beasts of burden, these bags signify the women's exlusive power over the crop; the fuller they are, the prouder the women are of them. Thus, only

A,B [See Cat. 116, pp. 225, 226, respectively--Analyst]

462 women can carry produce to market. Coffee, however, is in a different
[562] category because the bags are of a special type, supplied by the coffee
factory and a specifically male property.
[422]

Section 3: Education, Occupational Skills, Money Income

241 In the last section, dealing with the division of labour, I
did not introduce the question whether there were differences in this
615 respect between the various social groups--lineages and clans. The
main differentiation noted by earlier authors was that between cash-
614 croppers and those engaging only in subsistence gardening. Now in this
respect there was no noticeable difference between clans in Sivepe:
out of 1,100 coffee trees growing in Sivepe in 1962, 503 belonged to
Jegase and Timumu and the rest to Seho, while in Inonda the coffee
growers belonged to two Andiriha lineages. In Sivepe today most men
grow coffee, and this applies equally to the Jegase, Seho and Sorovi
clans; the exceptions are elderly people. There are, however, very
significant differences in other respects between socio-economic
patterns in the Jegase and Seho clans--differences which are obvious
even on very superficial inquiry.

614 A minor imbalance in the age distribution of the two clans is
noticed at once from the statistics: the Jegase householders are
561 predominantly in the 35-45 year age group whereas Seho is predominantly
a little older (45-55 years). Hence the dance group formed in Sivepe
[535] is at present almost wholly composed of men of the Jegase clan. The
[177] age difference happens to be very significant in various indices of
acculturation, as the first school was established at Sasembata in
[871] 1945, and the custom of looking for wage labour outside the district
did not become widespread until about the same time. While some Jegase
[167] people know some English, none of the Seho people over 35 speak any
at all. Furthermore, the first village constable and the first councillor
[191] in Sivepe were both Jegase men who had taken up employment well before
the second world war. During the years they held these posts (1939-
1965), Seho had much less contact with government.

The statistics (Table 20)[A] show that Jegase male adults have
614 slightly more school education than Seho adults but a great deal more
463 occupational experience. This experience, for both clans, did not
include work requiring much formal training; it was labour on rubber
and cocoa plantations, on the roads, assistance with land surveys,
[177] laundry work, service as a "houseboy," and in the A.P.C. Nonetheless,
an intelligent man thrown into these kinds of situation can find out
a good deal about the outside world; in later dealings with external
agencies, he is able to make more informed judgments. A further
opportunity for such experience was offered the Jegase clan when the
Australian National University, which made Sivepe into a sample village
for several studies (see below, Chapter VII), decided to concentrate

[A] [See Cat. 116, p. 227--Analyst]

TABLE 7

FOOD PLANTS PER HOUSEHOLD: INONDA AND SIVEPE COMPARED

Sources: Crocombe and Hogbin, 1963: 8; Rimoldi, 1966: 17

Crop	Inonda		Sivepe	
	Average	Range	Average	Range
Taro (Colocasia sp.)	1.3 acs.	2.6 - 0.4 acs.	0.97 acs.	0.39 - 2.30 acs.
Sweet Potato	0.2 acs.	0.4 - 0 acs.	0.07 acs.	0 - 0.20 acs.
Corn	72 plants	140 - 0 plants	223 plants	0 - 442 plants
Bananas	81 trees	145 - 12 trees	71 trees	35 - 126 trees.
Pitpit (ina)	56 clumps	181 - 4 clumps	88 clumps	0 - 400 clumps
Sugar	71 clumps	167 - 34 clumps	34 stools	11-54 stools
Yams	24 vines	61 - 0 vines	65 vines	0 - 136 vines
Manioc	10 plants	27 - 4 plants	a few	
Taro (Xantosoma sp.)	5 plants	25 - 0 plants	28 plants	0 - 91 plants
Native Cabbage	---	---	22 plants	0 - 100 plants
Pawpaw	---	---	17 trees	5 - 32 trees
Beans	a few		17 plants	0 - 110 plants
Cucurbits	2 vines	10 - 0 vines	13 vines	9 - 28 vines
Saallots	a few		a few	
Ginger	---	---	a few	
Tobacco	---	---	18 plants	0 - 59 plants
Pineapples	1 plant	7 - 0 plants	no data	
Tomatoes	a few	---	no data	

101 These so-called "mountain Orokaiva" have been described
in considerable ethnographic detail by Williams.[2] Pioneer
administrators considered them to be the most ferocious of
New Guinea peoples. No tradition exists showing familiarity
133 with vulcanism in the area, apart from one or two dubious
hints in myth incident. The nearest volcanic outbreak oc-
curred nearly a decade ago in the Tufi district, a considerable
distance to the southeast. Mt. Lamington (5,634 ft.) with
its irregular humps of old ash cones and its dense vegetation
cover has always been regarded as being extinct. The Oro-
241 kaiva worked their hamlets and gardens high up on the rich
soil of its sprawling flanks, achieving perhaps the densest
361 settlement patterns of any of the shifting "dry" cultivators
in the New Guinea area.[3] They lacked any background
731 conditioning to cushion the shock as did the whites who
developed a Mission station, a Government coffee plantation,
other "native" cooperative enterprises in the Sangara area,
and, during the war, a mountain rest center which became
the district headquarters at Higaturu.

133 The first eruption came on a Sunday morning after three
anxious days of earth tremors during which official and
731 Mission personnel hesitated to frighten the people by sug-
gesting evacuation. The eruption had the classic Mont Pele
pattern: an exploding gas cloud engulfed an area of about eight miles in every direction and then sucked back. Hot ash covered a very much larger area, and the rivers whose sources are around the peak—the Kumusi, Ambogo, and others well known for bitter fighting during the war—became choked with ash flows. The Higatura and Sangara centers on the north side caught the full blast and were virtually flattened, as it was this side of the mountain which blew out. Almost 100 percent casualties occurred in the area engulfed by the gas cloud. Since the bodies were often in good

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[113] [2] Williams, F. E., *Orokaiva Magic* (1928); *Orokaiva Society* (1930). The Orokaiva and their culture are also referred to extensively in Annual Reports of the Territory from 1890 on, particularly by Chinnery and Beaver in the 1914-15 and 1918-19 reports.

[3] Williams speaks of the Lamington slopes as "thickly populated and with innumerable garden-clearings . . . one of the most fertile and beautiful in all Papua" (*Orokaiva Magic*, p. 110).

133 eruptions has subsequently continued, and reports as of December, 1951, show a persistence of these conditions and a
731 recurrence of bad earth tremors. In other words the Orokaiva, Government and Mission are having to learn to live with the volcano for an indefinite period.

731 An observer passing through or flying over destroyed areas was struck by the fact that plants with large fleshy foliage
● 241 such as taro (the staple food of the Orokaiva) and bananas tended to green over quickly. Root crops indeed sometimes showed accelerated growth, presumably through combined ash-rain fertilization, though considerable rotting set in later. Squads of men were organized to go into the more accessible areas within the blast perimeter to gather such surviving crops, though they were not permitted to stay overnight. These foodstuffs supplemented the official rations which consisted of rice, canned meat, some wheatmeal, peas, salt, sugar, and tea in generous quantity.

731 Within two months the whole situation was becoming reasonably "structured." The Government vulcanologist had defined a danger zone from eight to 12 miles around the active crater; no individual could go inside this area except with an official pass, and then only by day and for good reason. Those groups whose living sites were outside this closed area, or who could get land from relatives or others, were being allowed to resettle under conditions closely prescribed by supervising Government officers (this will be enlarged upon later in this paper). On this basis, some 2,500 persons had already left the refugee camps, though they were still being rationed to some degree. The "Sangara" people had been transported back inland from the Eroro camp to the Popendetta camp and adjacent zones within a few miles of their homes. The "Isivita" people at Oro Bay, numbering some 600, were being transported in batches of some 35 persons every other day by launch from the Oro Bay camp to Killerton, by truck to the Popendetta camp, then by small Dragon Moth plane to the Kokoda airstrip. From here they walked the approximately 20 miles to the Ilimo camp on the western side of the mountain where they had lived formerly. The Oro Bay camp was in this way closed down by May. At Ilimo, some 2,000 persons were living either in the first temporary huts such as the Orokaiva build for emergency or short-term housing, or in large newly-constructed houses of a more permanent type. (Somewhat later this camp population was reduced to about 1,500, comprised essentially of the surviving people from the west side of the mountain whose homes were in the closed-off area and who had not been able to find resettlement places outside). The Ilimo camp had a staff of some 14 white officials, aided by Papuan police and other assistants. In addition to the various welfare activities, there were schools for children and adults, sports, a community hall, and a large block of garden land broken in with tractors and other modern tools. Government was using it as an experiment in "community development" as well as a relief center.

731 By that time, too, a whole series of policy problems had
657 arisen which both the field staffs and the Australian authori-
177 ties at Canberra and Port Moresby were trying to resolve. Most serious was the question of how far the crucial break
[361] with the past should be used as an opportunity to encourage

731 or even force Orokaiva settlement patterns from the tradi-
657 tional scattered hamlet system to village or even town living.
177 Another tough question was how far Government should step
[361] in to supervise matters of economic and social welfare, includ-
[797] ing elementary schooling which hitherto policy had left al-
most wholly to the Anglican Mission. The majority of the
mountain Orokaiva are now adherents of this Mission, the
only body operating in the area. Questions relating to land
tenure, social group realignment, leadership, law and order,
and other matters involving local custom had also to be
faced, especially in the course of the first experiments in re-
settlement.[4]

734 Officials and Mission workers reported that the explana-
784 tions of the "cause" of the disaster given to them by Oro-
kaiva, were, in general, of a supernatural nature: "God"
was punishing them for "sins" such as "not supporting Mis-
sion and Government plans for development," "not building
new churches as requested by the Bishop," or "not helping
the Allies enough during the war." However much these may
731 have pleased the hearers, the fact seems to be that there were
152 resulting strong feelings of insecurity and even of guilt in
their retrospective look at the pre-eruption way of life.[5]
Officials who know the Orokaiva considered that these feel-
ings undoubtedly helped to foster the extraordinary degree
of cooperation and orderliness in situations where large
numbers of people were necessarily herded together and
shifted around without benefit of the traditional niceties
and proprieties.

This raises the whole problem of interpreting the overt
121 events here summarized in terms of their cultural and indi-
731 vidual contexts. In discussing theory relating to the dynamics
of change and resistance to change, the writer, along with
178 others, has referred elsewhere to the general tendency for
peoples to be pre-conditioned by the characteristic sets of their
182 culture and personality norms, to be differentially "adaptable"
or responsive to change in the face of new experiences.[6] The
impression gained in this case is that subject to inevitable
factors of shock and disorganization, the Orokaiva were cul-
turally predisposed to respond to the traumatic experience
here described with something approaching maximum adapt-
ability.

262 The mountain Orokaiva are shifting cultivators, and sup-
plement their staple food, taro, with sweet potato, yam,
banana and sugar cane. Flesh from domestic pigs, chickens,
dogs, and wild game is what Williams calls "a dainty rather
241 than a diet." "Fresh ground," says this ethnographer, "is
continually cleared for new plantings" in the typical pattern

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[113] [4] These matters are discussed particularly by C. S. Belshaw, an anthropologist working in Papua under the auspices of the Australian National University Research School of Pacific Studies, as a result of a visit to the area in April, 1951; see his "Social Consequences of the Mount Lamington Eruption," *Oceania*, 21, 4, pp. 241-252 (1951). This article was not seen until after the first draft of this paper was completed, and as the approach is considerably different the two papers are complementary rather than unduly overlapping.

[5] Belshaw, *op. cit.*, p. 242, stresses this "guilt" factor.

[113] [6] F. J. Keesing, "Some Notes on Acculturation Study," Sixth Pacific Science Congress, *Proceedings*, IV, pp. 59-63 (Berkeley, 1940); "Cultural Dynamics and Administration," Seventh Pacific Science Congress, *Proceedings*, 14 pp., mimeographed (New Zealand, 1949).

241 of "dry" gardening, with fire and the digging stick as the
essential tools, and either long term rotation of previously
occupied areas or breaking in of new forest land. "The im-
mediate family . . . is a self sufficient unit" and "the Orokaiva
words for 'work' and 'garden' are one and the same." Con-
621 sistent with this mobile economic base, settlements are rarely
more than hamlet size, with "hardly more than a dozen
houses" on the average. Materials for housing are readily
available, so that residence can be easily shifted.

The hamlet is based normally on patrilocal-patrilineal prin-
ciples of organization, with a known strong tendency for
new groups to form by "hiving off." Clan affiliations are
[614] reckoned from quite recent ancestors, so that at times a
given clan may all be in one settlement, though more usually
scattered through several closely related settlements. The
592 generally monogamous family units are under the "immediate
621 authority of the father," while the affairs of the local living
units are under loose supervision by the hamlet and clan
622 elders, centered on a "men's house" and working together,
usually with one strong senior man as "leader." Personal
422 property consists of mobile goods such as tools and utensils,
clothing, and body ornaments.

181 In spite of ethnic similarities over a wide region, Williams
speaks of the Orokaiva as being a "more than usually quarrel-
some and disunited people"—a strong statement to make in
the New Guinea setting. Their pre-pacification history was
marked by "feuds, dispersals . . . a veritable whirlpool of
strife, migration, and counter-migration." Beaver, too, refers
to their "turbulent and restless life . . . migration was, in
[754] the main, a matter of attacking, fleeing, and pursuing." Super-
natural weapons in the form of sorcery were especially feared.
Even for Papuans, the Orokaiva proved to be unusually
[562] hostile and resistant to whites. Women were often seen ac-
companying the war parties, carrying food and weapons, and
[726] sometimes joining in fights. Williams goes on to say that
while the "elementary small sympathy-groups" (the local
[628] kin and settlement units, and to a lesser extent the dispersed
clan units) were tightly knit, their external relations were
precarious. "There were peacemakings or truces, but the
[728] truce was always a fragile one, and no (settlement) lived
in permanent security." "Hiving off" occurred sometimes
361 as the result of a "quarrel and the fear of retaliatory magic,"
241 but more often it was "simply the lax method of horticulture
which necessitates the clearing of many areas in succession
[578] and sometimes a temporary settlement on a distant site."
Another factor could have been food scarcities which tend
361 to occur in exceptionally dry southeast winter seasons. During
261 this period, north and west Lamington area is in a rainshadow
zone, and people may have to scatter out to live on wild
731 roots and fruits. The implication of this is that even the
excision of the 4,000 persons from the Orokaiva group who
165 were killed involved no extensive shattering of valued ties.

361 Williams and others judge that with the modern pacifica-
tion, the Orokaiva have tended to disperse in even smaller
178 living units than before. This appears to apply particularly
[797] to the relatively densely populated Lamington slopes, though
a few instances of larger aggregations approaching a village-
type also occurred, particularly as a result of Mission influ-
361 ence. Over against this greater dispersal, the people have
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[p.18-B]

731 657 361 177 liberately endeavored to keep everyone busy, and the men spent much of the time in work gangs (e.g. Monday, Tuesday and Wednesday were usually devoted to house-building; Tuesday, Wednesday and Thursday to gardens; Friday to roads and hygiene). But leadership and organization were creatures of Government, and to some extent of Mission. There were no significant signs of a self-motivated superstructure taking form other than the strengthening of scattered clan ties. Consequently, should larger communities be established with the purpose of preventing the people from scattering out again, they would have to be bureaucratically or theocratically controlled with all the dubious consequences such a situation can entail.

731 657 578 [625] 2. Reasonable law and order was being maintained in the new settlements, under the eye of a considerable force of the Papuan Constabulary sent in for the emergency. Opponents of a concentration policy claimed, however, that the older patterns of intergroup hostility and violence are not far enough below the surface to justify the risks involved in larger long-term aggregation. As indicated, problems of land tenure are a major potential source of conflict. Another is "woman trouble," judging from experience in the camps where husbands and wives find themselves in informal association with members of the opposite sex, in contrast to the normal tightly structured small units.

731 754 514 3. Not least among the uncertain factors is that of sorcery. According to those who manage the settlements, fear of coming under the influence of strangers who practice sorcery shows itself as a vague but persistent factor. Most overtly it has emerged in connection with the disposal of waste products in the large camps. In typical Papuan fashion the Orokaiva is extremely secretive in his disposal of faeces and other leavings of his body because of the possibility of their use against him in harmful magic. A crucial question, therefore, has been whether group toilets could provide enough anonymity to forestall opportunities for the practice of sorcery. The problem was dealt with where possible by putting men's and women's latrines over running water. This social-supernatural sanitation problem could be serious where long term settlement of large groups is being planned.

731 361 241 [242] 4. On the economic side, no sound basis seems in sight for establishing large permanent communities in the comprehensive manner proposed. As indicated, the familiar pattern of shifting gardens will normally involve seasonal movement outward from the immediate environs of the new settlements where most present cultivations are now being made. As yet, no widespread disposition exists to adopt more intensive sedentary cultivation, although undoubtedly some will be prepared to try to continue cooperative experiments with rice and other crops and, hence, will be amenable to Government and Mission encouragement and aid here. As 731 657 [241] [177] in socio-political affairs, the responsible organization and leadership would in general have to be provided from outside, with the dependence relationship that this implies. Government might have to continue helping any large community for an indefinite period, as with the mechanized agricultural production it is introducing at the Ilimo camp. 731 231 In large settlements the technique of handling domestic pigs and chickens, vital sources of protein, is always a difficult

[p. 21-A]

731 This was in accordance with the official policy of the Territory
797 that mission bodies shall normally handle at least
872 the first four years of "village" level schooling. In such a
[657] major center as Ilimo, however, the question arose as to
whether Government should step in to provide more adequate
schooling facilities as part of its "community development"
program. This was complicated by the fact that children
of non-adherents had to come under the Mission teachers
if they were to get schooling. The writer was told that in
[875] the morning these teachers went through the camp with
switches to get children to school. Another potential conflict
[241] was foreshadowed at the time of the writer's visit by
the Mission's decision to send in agricultural workers in
[657] the face of the active program of rehabilitation by Government
technical officers.

The writer gave it as his opinion that the Government
657 should not abrogate its responsibilities in essential matters
of rehabilitation, that it should insist on coordination rather than rivalry. It is understood that this view has been made policy, even in the face of the great sensitivity of Government in such delicate relationships that could reflect back in the form of criticism by religious groups in the metropolitan country. Government schools have been opened and the people are free to choose between them and the Mission institutions. Official medical services have become well organized. It will undoubtedly take time to unravel the question of the Mission role in agriculture, particularly as it is bound up with the religiously-oriented cooperative movement. There could be further new cults centered upon gardening and, as with various other post-war movements in the New Guinea area, these could be either pro- or anti-Government or Mission or both.[10]

241 The possibility of transforming Orokaiva agriculture from
177 the shifting to a sedentary basis deserves a special final
word. A recent report of the Director of Agriculture stresses
this problem as of prime importance to the development of

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[10] Though extensive materials exist in unpublished official reports
[113] on post-war New Guinea cults (e.g., the Paliau movement in Manus, the Yali cult in Madang, the Tommy Kabu cult in the Purari delta) very little has been published. Available references are Belshaw, C.S., "The Significance of Modern Cults in Melanesian Development," *The Australian Outlook*, 4, 2, pp. 116-125 (1950); de Bruyn, J.V., "The Mansren Cult of Biak," *South Pacific* (Journal of the Australian School of Pacific Administration, Sydney), 5, 1, pp. 1-10 (1950); Guiart, J., "Cargo Cults and Political Evolution in Melanesia," *South Pacific*, 5, 7, pp. 128-129 (1951); United Nations Mission, *Report of Visiting Mission, 1950* section on Paliau movement, reproduced in *South Pacific*, 4, pp. 207-208 (1950). A brief analysis of modern cults is given in Keesing, "Research Opportunities in New Guinea," *Southwestern Journal of Anthropology*, 8, 2 (Summer, 1952).

241 the Territory to the point of self-sufficiency and dietary adequacy
177 and one on which almost no progress has been made.
Theoretically the problem does not look difficult, in view
of the characteristic adaptability of the Orokaiva, the loose
group organization which involves no elaborately structured
hierarchy of vested interests in the *status quo*, and the freedom
of families to experiment as they wish as more or less
independent production units. But here, as in the case of
shifting gardeners in many comparable situations, the problem
is one of motivation, of incentives. Among the Orokaiva,
for all the enthusiasm they have engendered, past religious
and cooperative movements have not struck seriously at
the rotational basis of cropping, or introduced fertilization
and other soil-maintenance techniques. The territorial Department
[654] of Agriculture is desperately short of manpower
and it is not likely that it can afford to station a permanent
cadre of technical personnel to guide and supervise this
[797] still quite remote district. It is also very doubtful that the
Anglican mission could do so. Nevertheless, at the centers
referred to above, the present dynamic situation justifies giving
encouragement and aid on a voluntary basis to any
families and individuals who may wish to try out sedentary
cultivation, market saleable products, and on a cooperative
basis of organization where desired. Such a non-compulsive
widening of the range of cultural alternatives seems in line
with a current strong stirring of ambition among some of
the younger, schooled Papuans to adapt to the modern world
and have a greater voice in the affairs of the Territory.

731 To the extent that this paper presents a correct interpretation,
its implication is that this catastrophic shock has produced
177 something approximating a minimum degree of cultural
178 trauma, considering the demographic dimensions and
the destruction and death involved. Predispositions in Orokaiva
121 culture and personality favored relatively easy "adaptive"
behavior in the face of crisis. The remarkably effective
[657] relief measures taken by the Australian authorities helped
materially to cushion the situation. Any attempt by Government
and Mission to use the emergency to manipulate such
a people and culture arbitrarily in drastically new economic
and socio-political directions would seem foredoomed to
failure, and would generate unwanted tensions. Yet opportunities
are clearly present for economic and other stimulation
121 and education of a voluntary and permissive type. Considered
as a case study in cultural dynamics it is illustrative
both of internal readjustment in a culture where a sharp
shock and break in continuity occurs, and of the implications
of attempted control and direction in culture process by a
dominant outside authority.

[p.22-B]

phasis on the "logic of the concrete," is equally insistent on precision in matters of material culture, because in the analysis of symbols it often happens that important distinctions are made between species, varieties, subvarieties, methods of food preparation, of the manufacture of objects, and the like. 121

Quite apart from this concern with meticulous classification, componential analysis, and lexical-semantic relations, it seems to me profitable to turn to the semiotics of material objects, especially if the field of connotation and denotation crosscuts numerous levels of conceptualization. There are some objects in every culture which may almost be regarded as "total phenomena" in the Maussian sense: they are at once of economic value, expressive of social relations, ploys in a political strategy, and religious symbols. They also appear as the subjects of myths. As a general rule, they are utilized as objects of exchange, which explains why they are as multivalent as exchange itself.

At least part of their significance in anthropology lies in their capability to link the levels of myth and ritual. The best way of explaining what I mean by this suggestion is to give some instances of semiotic analyses of objects which may be called "total phenomena," and include in these analyses the levels of both myth and ritual. Their role as "logical operators" linking these levels will then become obvious. Though my argument draws on a wide range of structuralist literature, the most important sources are Lévi-Strauss' introduction to Mauss' *Sociologie et anthropologie* (Lévi-Strauss 1950) and the Finale of *L'Homme Nu* (1971).

The ethnographic data are from the Orokaiva, a tribe in the 101
northern district of Papua, where I did fieldwork for one year
in 1966–1967 and for another three months in 1970.[1] The Oro- 131
kaiva live on the fertile slopes of Mount Lamington. They are
swidden agriculturists, whose main crop is taro, while yam, sweet 241
potato, sago, sugar cane, coconut, and numerous other nuts, as
well as latterly German taro are subsidiary crops. Areca grows
in most of the district. The population of 25,000 is very dense 161
on the actual slopes of the volcano, sparser in the riverine areas. 361
The kinship system is patrilineal, with a strong bilateral emphasis. I have given a detailed description of the various forms of 602

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Orokaiva marriage (Schwimmer, 1970) and have shown that sister-exchange marriage, though infrequent, is regarded as the ideal form. Elopement and abduction marriages, once the most frequent, are now frowned upon, though elopement is still prevalent. The patrilateral preference rule (marrying out a girl in her mother's village) is still regularly stated by informants. In my records, which go back to the third generation, I found that 35% of the resident married women had been married out by that rule for the whole three generations, i.e., they had been exchanged for their mothers and their mothers for their grandmothers. 582 [114] [583]

In the study [2] that follows, I shall first present data concerning the coconut and areca, then about the taro. I shall follow this presentation with a brief discussion about the relation between the levels of myth and ritual. 128

1. COCONUT AND ARECA

A salient characteristic of the ethnobotany of the Orokaiva is the classification of plants as masculine and feminine. Certain important cultivars are grouped together as opposite-sex couples and grown in close association with one another. Claims are made that such plants will not prosper unless they are planted close together and that, in their wild state, they are also found together. 824 [241]

The symbolic association of these pairs of plants may be based on a number of shared characteristics: the similar outward appearance of the fruit, a coincidence in the time of fruiting, and similarities in culinary use, taste, and supposed physiological effects of the fruit when eaten. Sometimes the pairs of plants are linked in ritual use and in a common myth.

Coconut and areca are planted together in villages as well as gardens. Both nuts are eaten raw between meals; both grow on palms; both are offered to visitors—the coconut as refreshment immediately upon arrival and the areca (along with *hingi* pepper and lime) for chewing during the conversation. At mortuary feasts coconut and areca are the principal gifts, offered in large quantities to guests from villages who helped to bury 262 [245] [574] [764]

121 between the other two. Their existence is known, but some will not see their cognitive genesis. They tend to arise as they are logically implied by the two dominant ones; anyone who does not like 1 and 2 cannot help but think of 3 or 4 or both.

Identification in the Creation of Use Values

461 When Councillor Colin said that '*pure ari*' did not begin until Jesus Christ (i.e. people did not 'work' before that time) he ignored that *pure ari* in its primary meaning stands for 'to garden' and *pure* is a garden. From an empirical viewpoint we know exactly what goes on in a Sivepe garden, as Waddell has carefully measured it. The daily visit to the garden described by informants as *pure ali* takes a mean of 265 minutes of which 'main task' and 'ancillary tasks' take up in all 44.2% (Waddell and Krinks 1968: 113). The rest is devoted to travel, rest, meals, cooking, washing, other tasks. People always go to the *pure*; they do what they need to do. The amount of 'work' they have does not determine how long they stay. Sometimes they 'work' very hard, sometimes hardly at all.

The gardening tasks are done at a moderate pace which is
pleasurable. Rushing and heavy burdens are avoided when possible,
but when they are necessary they are classified as 'toil' (*pure*
[805] *galha*) and people rest later to make up for it. The only time
measures used are: early morning, midday, afternoon (meaning:
time to go home) and evening-night (meaning: after supper).
● [241] Though gardens have a principal crop, mostly taro, the subsidiary
crops, ornamental trees, garden house etc. are charmingly landscaped so that the garden is in a sense an artistic creation
(Malinowski 1935; F. Panoff 1969). Whether rows are regular and
what is the general standard of husbandry are very much
[829] individual matters. It is said that by looking at a person's garden
one can read his or her character. Among the Orokaiva the girls
[581] are said always to look at a boy's garden before marrying him. De
Coppet (1976) reports the same for the Are'are of Malaita, except
that it is the girls who are more under scrutiny. The criteria would
partly be the style of the garden, showing a pattern of mind, but
also and largely the size of the garden, the size and the health of
the plants, the quality of the varieties.

241 One could keep on with such description for a long time with-
out coming closer to defining garden work as a concept. Myths
773 and rites prescribe details of the gardening cycle for each of the
824 principal crops while at the same time establishing identification
between grower and crop: taro is a mother; a mother Taro is
invoked; married women think of their taro as their children. The

241 taro ancestress is usually described as discovering the taro in a lake
or other 'round water'. The demigod Totima comes closest to
773 providing a general model of the primeval world of the swidden
824 agriculturist and pig-raiser. Like Prometheus he is a sacrificial
figure.[16]

Totoima was at the origin of the feasting institution (though
577 there are other myths of the origin of feasting). It is here that
773 questions of moral values mostly arise as feasting (*ergo* peace
making) is the moral act *par excellence.* A direct connection is
laid between the virtue of settling conflict and of feasting on the
one hand and the fertility and yield of the garden on the other,
241 as enemies are thought to ensorcell the gardens. Another important
596 factor was the 'care' (*simbari*) (a general term covering magical as
well as technical aspects) taken of the garden. The eldest male of the
extended family, as father of the land, had a special duty as regards
[769] *simbari.* Garden magic was, however, made by all married males;
they also made gifts to ancestors, who were thought to live in
gardens and be reborn from there.

554 The model of the virtuous man was he who shared out his produce
and made feasts (*hande embo*). Such a man would grow a surplus of
577 food in a feasting garden. His power (*ivo*) would be manifest in the
abundance of his pigs and taro. The model of the 'active man'
would be the organizer of feasts in which the whole village participated (*kiti jigari embo*). Subordinate to him, but still high in
reputation, would be experts at sorcery, healing, feather
decoration and various forms of hunting, as well as those excelling
in debate, rhetoric and diplomacy (*keari embo*).[17]

241 Identification occurred not only with crops, gods and ancestors,
but also with trees harbouring local spirits, plant emblems harbouring
774 lineage ancestors, animal guardians and plant doubles which were
kept in the garden (usually surrounded by medicinal herbs) and
contained the owner's life spirit, or perhaps name-spirit for the
man bore the plant's name. A more complex aspect of identification
with pigs and feast gardens is that such produce is destined to be
given away, i.e. the owner expects to lose control over it; yet the
donor remains identified with it and it calls for a return.[18] The
same is true for the range of manufactures (clothes, pots,
ornaments) that change hands at feasts.

437 The pattern described here is characteristic of what Sahlins
(1974) called the domestic mode of production. Such a system
436 produces, in his opinion, nothing but use values, even if they are
'exchanged' at feasts, for such 'exchange' is symbolically equivalent
to a temporary extension of commensality. Slightly more complex

437 is the contemporary case where money replaces traditional valuables.
436 Is this money a 'use value'? Anthropologists have often analyzed it as
such and not without some justification; the Orokaiva for instance
[583] present brideprice banknotes tied one by one to a tall sapling carried
aloft by the donor and thus transported to the wifegiver. After
presentation it is often stored in wait for other similar occasions.
The fact is, however, that eventually this treasure is converted into
exchange values. Furthermore, it owes its status as a valuable to its
potential exchange value. It is therefore more easily accounted for
in the preset four-system method of analysis as will appear later.

437 The same remark may be made in respect of labour assistance
between households which is normally given without payments
476 except for a meal at the end of the day. If, however, the service
is given in connection with work for which the person assisted will
eventually get paid, then the service falls within a different
[427] category and must be paid for. The same rule applies to the granting
of land useholds for which no rent is ever demanded if the land
produces (only) use values, but the situation changes when it
produces exchange values. Use value is therefore a concept determining Orokaiva behaviour.

829 Finally, it is as true of the Orokaiva as of the ancient Greeks that
conflict and war (*isoro*) did not have a necessarily negative connotation
connotation. They might be bad or good according to circumstances.
War, sorcery and other forms of negative reciprocity are part of this
mode of production; they cannot be equated to 'alienation'. There
is increasing evidence that Levi-Strauss (1943) was correct in viewing
war in these societies as a modality of interdependence.

241 To sum up, the Orokaiva had a basic classification of *pure* as
between subsistence and feasting. An inspection of the crop by the
824 feast-giver was needed to let crops pass from the subsistence to the
feasting category. (It was not done if the harvest was insufficient.)
The term *pure ari*, whatever its customary translation into English,
was never used to denote any kind of effectiveness in ensuring a
food supply. In case of garden failure, people did not ascribe it to
neglectful *pure ari* but rather to neglectful *simbari*. It is the demigods
of the various crops and the ancestors who do the actual producing
in the garden, and all that is expected of man is to clear, to plant
and to protect against magical and technical dangers. Watchfulness
is the key; toil is a consequence. A flawless garden testifies to
watchfulness in the first instance; to physical prowess also, but only
in the second instance. In this respect i.e. the technical as well as the
magical watchfulness, *pure ari* is intermediate between the Greek
concepts of ΕΡΓΟΝ and ΤΕΧΝΗ.

● 241 Time is therefore a highly inappropriate measure of useful activity
in Orokaiva gardens. Whether *simbari* is effective or ineffective does
461 not depend just on the time spent. It depends on the warding off
of sorcery and hence on ensuring one has no dangerous enemies.
It depends on harmony in the family. It depends on avoiding
straying pigs, not just by building fences but by being the kind of
person into whose garden one does not want one's pigs to stray.
The anthropological observer notices a certain selectiveness in
Orokaiva pigs . . .

554 A great man, or a manager, is not always a gardener. He may be
a sorcerer. But if he is a gardener he is a great gardener. He
461 accomplishes his garden as a craftsman accomplishes a model, an
ΕΙΔΟΣ, or as Orokaiva say, an *ove*. His image of the world is not
dark like that of Hesiod or of Adam's curse. An Orokaiva inform-
[773] ant once recorded for me on tape his version of the relevant
[177] portion of Genesis:

> [539] "You will bear children, lift string bags, draw water; you will do all those things and be loaded down with sorrow, so He said; and then He spoke to her husband Adam thus: You will take the axe, cut the second growth, chop down the trees, lop off the branches. In the hot sun, in sorrow, with pain all over your body, you will labour hard." He said.
>
> He thereupon determined that Eve and Adam spoke thus: "This is the way we shall all wish to act on earth: our bodies will be painful from work; and the women as well as the men will be in pain and sorrow from hard work. And as our food will be prepared and ready we stay to eat. All right we did not know that God would not let us have what we had taken and eaten."
>
> Therefore God said to them: "Long will be the day of sorrow when you have sorrow, but when you have happy days you will be happy." So he said. Therefore we shall live in this way from now onwards . . ."

This interpretation is not, I believe, merely garbled. It is a clear message that the Orokaiva just will not understand why, after working hard in the sun, they should afterwards eat their bread or taro in sorrow. To them, this is not a mere question of how they would feel, but a moral matter. Whoever wrote the original of this text was obviously lacking in respect for bread or targo.

Daniel de Coppet (1976) rightly suggested gardening in Melanesia was a religious act, like a sacrament, as is also eating the produce. Whatever pain there may be is sacramentally transformed. Man feels his unity with the Taro goddess and also with the garden and the crop.